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Letters

Kissing the Clones Good-Bye

YOUR STORY ON THE END OF LICENSING, "Why Apple Pulled the Plug" (*News*, November 1997), was one of the most depressing articles I've read about the future of Apple and the Macintosh. I believe that what Michael Spindler said in 1994 still holds true: The clones were "good news for anyone who believes in innovation, competition, and responding to customer needs."

Suppose Apple were able to take the same approach to peripherals. Suppose Mac owners could buy *only* an Apple printer, scanner, or digital camera? How many of these Apple products has *Macworld* rated as an Editors' Choice in recent reviews? Apple ended the licenses because it was unable to compete.

Apple was trounced in performance by PCs in the early nineties. The clones were the ones who reversed this, and now they're gone. Ending the licensing agreements may have kept Apple from going out of business today, but my biggest fear is that it ultimately seals the company's doom for tomorrow.

Maybe Steve Jobs and his team can pull Apple out of its doldrums. But terminating the licenses sounds to me like the desperate act of a dying company.

JASON HAROOTUNIAN
New York, New York

THE "WHY APPLE PULLED THE Plug" article was an informative analysis but noted only that it's an "open question" whether the price/performance ratio of Apple's machines will be able to keep pace with that of Wintel machines. Even if clone makers were still allowed to produce cheap machines, this is more than just academic speculation—after all, Apple spent ten years getting bloated and



lazy, spoiled on fat Mac profit margins.

I'd be interested in seeing *Macworld* devise a real, quantitative price/performance ratio and apply it to Apple's future machines. Rate them against each other, the former clone makers' standards, and the Wintel world. I love the Macintosh, but keep the pressure on Apple!

BEN BOND
Washington, D.C.

Ad Campaign Misses the Mark

I JUST SAW APPLE'S AD ON THE BACK cover of *Newsweek*—the one with the full-page photo of Albert Einstein and the tiny words at the top exhorting us to "think different." Apple's marketing execs should take their own advice.

I really don't care about a computer's karma or its appeal to "the rest of us" (whoever "the rest of us" is). What I want to know is how this machine is going to help me run my business more efficiently

than all the other computers out there. That's it. That's what the late, much lamented Power Computing did best. It made great computers and then convinced you to buy them with some savvy, in-your-face advertising.

Why can't Apple do the same? Flood the media with a marketing blitz flat-out boasting about the most powerful desktop computers available anywhere, with an OS and business software that make Windows look like the cheap knockoff it is.

I can run my Mac-based business more efficiently because the interface is easier to work with and I don't have the compatibility problems my friends with PCs regularly struggle with. That's the message Apple needs to disseminate to the masses.

That's the bottom line for me and anyone else getting ready to part with several thousand dollars on new hardware. It's that simple. Why doesn't Apple get it? Why can't Apple "think different"?

JIM TAYLOR
Mars Hill, North Carolina

Marketing 101 for Apple

IT'S NO REVELATION THAT APPLE has severe marketing problems. David Pogue equates this with bad public relations that shows up as bad press (*The Desktop Critic*, November 1997). Just fix the bad press and everything will be OK. But this is only part of the overall marketing problem.

In every aspect of marketing—product, price, promotion, and distribution—Apple falls woefully short. Its product line has gone from "insanely great" to soberly so-so, especially when compared with what is available in the Wintel world.

continues

CORRECTIONS

- *ClearlyHome* ("Master of Your Domain," *MacUser*, November 1997) is a product of ClearInk, not Clearway Technologies.
- The correct URL for OS 8 compatibility tips on the MacFixIt Web site ("Help Folder," *MacUser*, December 1997) is www.macfixit.com/reports/macos8.0.shtml.
- The correct phone number for Umax ("Bargain Systems," January 1998) is 510/226-6886.

Apple's prices are becoming more competitive but are still on the high side. Promotion falls way short. Advertising is sporadic and poorly designed

And Apple's sales and distribution are unbelievably bad. Just try shopping for a Mac in any retail outlet. At a local CompUSA, the Macs are off in a corner, virtually hidden behind shipping cartons stacked up in the aisles, and there's not a PowerBook in sight.

Much has been said about Apple's loyal customer base. This is a great asset, but it's of little consequence to the company's long-term health. Companies grow because they convince previously uncommitted prospects to choose their products over the competition. That is what marketing is all about. Selling only to your existing customers isn't enough. As the PC market keeps growing, Apple has doomed itself to a downward spiral of declining sales and market share. Apple needs to put together a coordinated, well-executed marketing program, something it has never shown itself able to do.

Speaking of loyal customers, the EvangeList, as a feel-good outlet for Mac fans, has become little more than an embarrassment. How many new customers have come out of that effort? How many wavering Macintosh users has it saved? What does Guy Kawasaki actually do for a living?

I've been a Mac user for nine years and I have no plans to change. But the reality is that I don't owe Apple my loyalty. Apple owes me. It can repay that debt by taking action in the marketplace to ensure that it will continue to get my business. If the powers in Cupertino don't realize that soon, it may be too late.

VICTOR H. PRUSHAN
Thousand Oaks, California

RIPped Off?

AFTER READING JOSEPH SCHORR'S article about color printers under \$500 ("Print It," November 1997), our department became interested in purchasing an Epson Stylus Photo.

I spoke with a local computer retailer who also said that the printer is great. However, he said that without Birmy Power Rip software (an additional \$400), the printer is very unreliable. He also said that you can't print from PostScript applications such as QuarkXPress, Macromedia FreeHand, or Adobe Photoshop unless you have Birmy Power Rip software. I don't think that this was mentioned in your article. Is the computer retailer correct?

ERIC AGREE
Bridgeton, Missouri

He's half-right. The Stylus Photo is a QuickDraw printer, not a PostScript printer, which means it can't interpret and render images created in PostScript—unless some kind of PostScript-interpreting software is added. But most of the newer illustration packages, such as Adobe Illustrator, do an excellent job of re-creating PostScript images by using QuickDraw, the Mac's built-in graphics language. So the output from such programs, even on a QuickDraw printer, is pretty acceptable.

On the other hand, QuickDraw printers can't handle EPS files that are imported into page-layout programs. If you create images in Illustrator and then drop them into a QuarkXPress page, the output from the XPress page on a QuickDraw printer is going to be crude and jagged.

You can get around this problem by using a low-cost PostScript-emulation program, such as StyleScript (\$149), from Infowave (604/473-3600, www.infowave.net), which creates a virtual PostScript engine that interprets the PostScript code for your printer.—Joseph Schorr

A New Alpha Order

THERE'S BEEN A LOT OF PRESS regarding the battle between Pentium-based PCs and the PowerPC Mac. PowerPCs have significant performance advantages over their counterpart. In terms of raw chip performance, the PowerPC 750 is about 13 percent faster than the equivalent Pentium II. However, there's another entry into the PC wars that is getting increasing attention in the

marketplace—Digital's Alpha AXP.

Alpha PCs are getting cheaper, have clock speeds of up to 600MHz (with bus speeds at 100MHz and above), run a native version of Windows NT, and have approximately 3,000 software titles available. Just recently, Alpha versions of both Excel and Word were released by Microsoft, which indicates its commitment to the platform.

Since Apple announced an upcoming Intel version of Rhapsody and the Windows NT Yellow Box, it might consider porting both products to the Alpha as well. There's a reasonable probability that the Alpha processor might erode the Pentium's future standing, giving Apple an opportunity to bring Rhapsody into a growing new market area.

STEVE LESKI
via Macworld Online

NCs? No Thanks.

IF STEVE JOBS AND LARRY ELLISON think they will leapfrog the rest of the world by abandoning the Mac in favor of the so-called network computer, they are forgetting one crucial factor. We, the people who live in the real world, don't have 100-Mbps Internet connections or work in office buildings wired with high-speed Ethernet. Without an infrastructure that can deliver Ethernet performance over phone lines or cable, NCs are doomed to be no more than a jump back into the world of dumb terminals with BBS interfaces. No one is going to abandon a PC running Netscape Navigator or Microsoft Internet Explorer, with their graphical user interfaces and multimedia capabilities, in exchange for silent amber letters on a black background. Been there, done that—remember?

BENJAMIN T. HU
Coupeville, Washington

Letters should be sent to *Letters*, Macworld, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically via CompuServe (70370,702), MCI Mail (294-8078), America Online (keyword Macworld), AppleLink (Macworld1), or the Internet (letters@macworld.com). Include a return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld. ■

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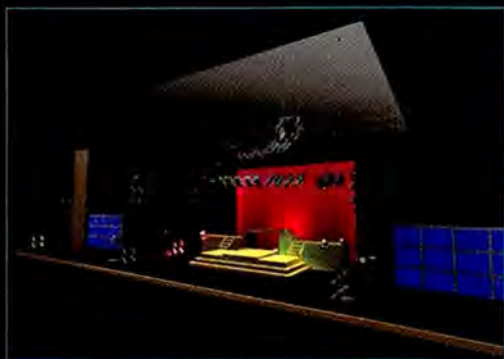
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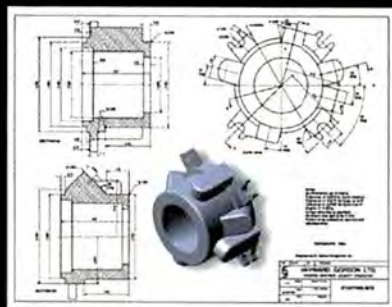
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The Relevance Engine

MACWORLD EVOLVES TO BETTER SERVE READERS' NEEDS

IHAVE ONE RULE I LIVE BY when it comes to publishing: A magazine's first job must always be to remain relevant to its readers. I've said this so many times around *Macworld's* hallowed halls that I'm sure more than a few of my fellow editors are ready to knock me down and gag me if I say it again. However, despite the possible threat to my person, I feel so strongly that this rule above all others must always be observed that I will continue to repeat it until I end my days in the retired editors' home, gagged and tied to my wheelchair by my fellow residents.

It's this issue of relevancy that has led *Macworld* to make a couple of changes in our lineup. In this issue, we debut *Create*, a section within *Macworld* dedicated to helping content creators get the most out of their computer investment. The other change is considerably more subtle but no less important: February marks the debut of Windows NT—interoperability coverage within *Macworld*.

MacNTworld, Not!

Now, before you all start spamming my e-mail box with protests and start calling me a Microsoft lover and other nasty names, let me explain two important factors in *Macworld's* entry into the NT world: First and most important, *Macworld* will always remain *Macworld* and as such will continue to be the essential Macintosh resource; we are not becoming *NTworld* or even *MacNTworld*. However—and here's where we get back to that relevancy thing—it's clear from your e-mail and other reader feedback that NT is becoming more and more of an issue for Macintosh users.

Mac users need information about NT written from a Macintosh perspective if they are to be able to sort out the facts from the marketing and to use NT where it can help extend the power of their Macintosh solution. It's clear that we don't live

in a Mac-only world, but there's a great chasm between accepting the reality that NT will be part of many highly productive Mac sites and making NT-based servers and workstations work well with their Mac brethren. We hope that with our Macintosh-targeted NT coverage, we will be able to help you bridge that gap safely, successfully, and with as little insanity as possible (after all, it is still Windows!).

More important, we'll tell you what—let's face it—few Windows-only magazines are going to tell you: how these solutions play with the Macintosh and whether they actually do make a good addition to a Mac-only solution.

In addition to giving you how-to



advice on making NT a well-behaved part of your Macintosh setup, *Macworld* will also review NT servers and interoperability products designed specifically to support the Macintosh. When we evaluate Mac-companion NT solutions, we will also give them mouse ratings, which debut in this issue.

And, of course, when Rhapsody is ready to play, we'll let you know how it compares with NT and whether Apple's first homegrown server OS is a movement you want to join in.

The Creative Spirit

The majority of the NT products *Macworld* will cover will likely be ones targeted at content creators—publishers, graphic artists, digital-video and multimedia producers—as these folks represent the heart and soul of today's Macintosh community. And it is precisely because creative professionals are more and more the focus of where the most interesting stuff is happening on the Macintosh platform that we are debuting *Create*, *Macworld's* new how-to department for creative computing. This new department will cover print, Web, digital-video, sound, and interactive solutions for people who use Mac products to produce everything from the next sales presentation to the next *Star Wars* trilogy. (Hey, think I'm joking? The Mac is all over George Lucas's Skywalker Ranch production facility.)

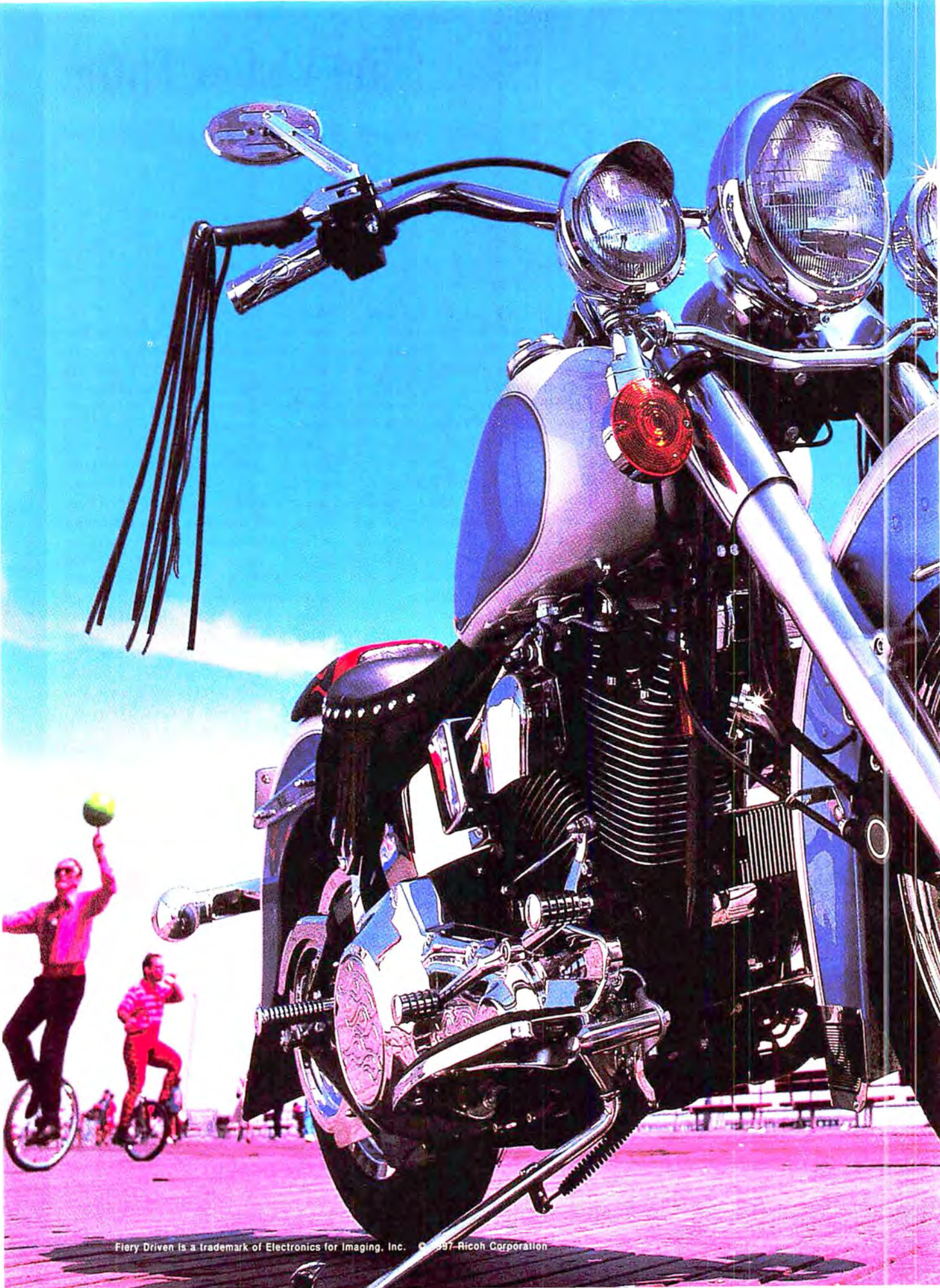
Our goal is simply this: if you use your Mac creatively, our magazine will give you the information you need in order to get the most out of your favorite computer.

Of course, the majority of *Macworld* will still cover all the cool workaday Macintosh products we all need in order to stay productive. After all, I have yet to see a graphic artist—much less a marketing manager or small-business owner—who could

completely avoid using e-mail or a word processor. But hopefully you'll agree that by adding a section that covers the issues that affect creative professionals, we're better serving your needs.

And stay tuned. There's more to come as we labor to remain relevant to you, whether you're a Macintosh enthusiast, a creative professional, or both. **m**

Got an opinion? Want to tell me about it? E-mail visionthing@macworld.com. Gag and ropes optional.



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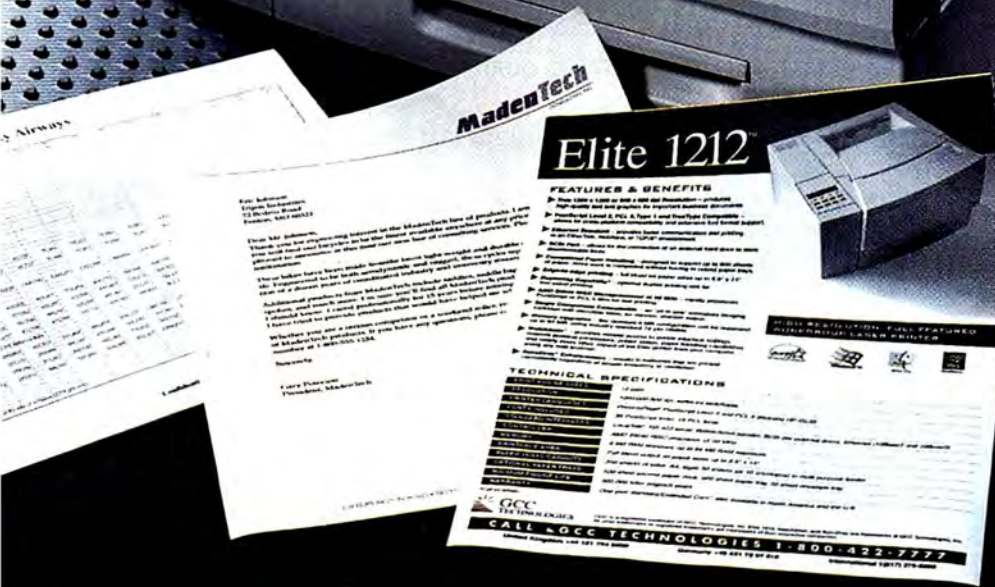
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News

cross-platform

Macs and NT: Allies or Adversaries?

CAN MACS SURVIVE IN
THE EXPANDING WORLD
OF WINDOWS NT?

by Cathy Abes

As Microsoft's Windows NT continues to challenge the Macintosh in its traditional domains of publishing and graphics, companies with extensive investments in Mac equipment—as well as Mac users themselves—are likely to feel backed up against the wall. They prefer the Mac but find themselves drawn by NT's speed, reliability, security, and enhanced Internet access.

Fortunately, you can have both. Windows NT Server 4.0 offers Macintosh connectivity, and version 5.0—currently in beta testing and slated for release in the second half of 1998—will expand Mac support even further. The upgrade will also offer many non-Mac-specific enhancements, including automatic Internet-protocol addressing, hierarchical storage management, and the ability to divide volumes and share workloads among multiple servers.

ARAP in 5.0 For Macin-

tosh users, the major addition in Windows NT Server 5.0 will be native support for Apple Remote Access Protocol (ARAP). With the current Windows NT Server 4.0, you can access an NT server only by dialing in with a PPP client—just as you would to connect to the Internet. Downloading files requires FTP software such as Fetch.

And you can't remotely access a local AppleTalk network.

With NT Server 5.0, your remote Mac can access the NT server from the Chooser, just as it would an AppleShare server. Except for the unusual-looking icon that suddenly appears on your desktop, you might not notice that you are connecting to an NT server. Once you've dialed in, you'll

get access to all your AppleTalk services, such as e-mail, and you'll be able to interact with other Macs on the network.

NT Server 4.0 requires the use of separate tools to administer files, users, remote access, and Web services. Version 5.0 will fully integrate these tools into its Management Console, a control center for configuring and managing network and



JOHN BLECK

application resources.

Active Directory Other new features in NT 5.0, although not specifically Mac-related, can still provide benefits to networked Macs. For example, because NT Server 5.0's new Active Directory—a central repository for user data and network resources—supports LDAP (Lightweight Directory Access Protocol, a platform-independent Internet standard for directory services), Macs running LDAP-enabled soft-

continues on page 32

industry

Apple Unveils Web Sales Strategy

WILL ALSO SET UP APPLE CENTERS AT COMPUSA

by Stephen Beale

When reporters and analysts gathered in Cupertino November 10 for a much ballyhooed Apple press conference, many were expecting big news, such as the long-awaited announcement of a permanent CEO. But the presentation proved to be much more modest: a trio of new systems based on the PowerPC 750 CPU (see "Apple's Next-Generation Systems," January 1998) and a virtual Apple store on the company Web site that lets you custom-configure your own Macs and buy them direct.

The latter, along with a previously announced partnership with CompUSA, signifies a new direction for Apple's retailing efforts. But it was no surprise; when Apple acquired Power Computing's Macintosh assets in Septem-

ber, the company said it wanted to take advantage of Power Computing's direct sales and build-to-order capabilities.

Online Store The new online Apple Store (www.apple.com), created with the company's WebObjects software, allows you to choose from all of Apple's core products, including Mac systems, servers, imaging hardware, and PDAs. Most systems are presented in three configurations, labeled good, better, and best. However, you can also configure your own Macs, choosing processors, memory, storage devices, and other components from menus on the Web site. You can order the system by phone or directly over the Web.

The online store currently works only for U.S. and Canadian customers, but Apple plans to have it work internationally in local currencies by spring. Apple also hopes to sell other companies' software by this spring.

Apple says that in-stock products can be delivered in as few as two days. Build-to-order systems are shipped in about two weeks. At present, only the new PowerPC 750-based Mac systems are available for custom configuration.

In establishing an online sales presence, Apple is taking aim at Dell Computer, which has been highly successful selling PCs over the Internet. But don't expect the kind of aggressive pricing you saw from Power Computing. To avoid conflict with retail channels, Apple will sell its products at suggested list prices, just as it did several years ago in an earlier short-lived direct-sales effort. That program lacked two key elements of the new one: the online presence and the custom-configuration capability.

A day after announcing the online store, Apple said that it had done \$500,000 in business in the first 12 hours, and some analysts suggested that extra sales from the Web site could go a long way toward cutting Apple's flow of red ink. However, there is some risk in launching such a complex system—which links the sales and manufacturing processes—on the eve of the busy holiday season. Apple says that it has error-checking procedures in place, but if customers encounter problems ordering systems—late delivery, wrong configurations, and so forth—it could become yet another black eye for the company.

Store within a Store Perhaps more significant than the online sales presence is Apple's deal with CompUSA, under which the latter will install Apple stores within CompUSA retail outlets; one of Apple's big problems recently has been waning commitment from major computer retailers.

The stores will feature



comprehensive selections of Mac hardware and software; Apple says it will train the stores' sales representatives.

CompUSA plans to have Apple stores in 54 outlets by the start of the holiday season, in areas with the most Macintosh sales: California, Boston, New York, Minneapolis, and Chicago. The retailer hopes to have the Apple stores in all of its 139 locations by April.

industry

Apple Braces for Price War with Dealers

RESELLERS OBJECT TO CUT IN CO-OP FUNDS

by Leander Kahney, MacWeek

Apple may be on the brink of a price war among its resellers, following widespread changes to its sales channels, including the November 10 launch of an online store (see "Apple Unveils Web Sales Strategy," in this section).

The first shot was fired shortly after Apple's November 10 announcement, when ClubMac, a large catalog reseller, started shipping Macs at prices about 5 percent lower than what Apple recommends.

ClubMac was quickly joined by Cyberian Outpost, one of the biggest online retailers, which in mid-November was offering the new desktop Power Mac G3 for \$1,889—\$110 less than Apple's price. ClubMac was shipping the system for \$1,890.

Others Join In Others were widely expected to join the fray. "I think we're on the verge of a huge price war," says Mike McNeill, president of Pacific Business Systems, ClubMac's parent company.

Apple for years has battled a "gray market" of discount dealers, but it has avoided price wars among authorized resellers, thanks to widespread adherence to its system of selling at or above a minimum advertised price (MAP).

In this system, designed to level the playing field, resellers that honor MAP are rewarded with "co-op funds"

continues

—cash to help cover the cost of advertising and marketing.

Co-opted? Contrary to news reports that the price cuts were prompted by competition from Apple's online store, ClubMac's McNeill says his company broke ranks following the news in October that Apple will cut co-op funds by 75 percent on January 1.

Jeff Hansen, Apple's senior director of channel sales and distribution, says a price war "benefits no one in the long run; it becomes impossible to sustain business."

He says price cutting puts a strain on the relationship between Apple and the resellers but is not grounds for removing them as authorized resellers.

publishing

Film Scanners Slide toward Consumers

OLYMPUS, MINOLTA,
KONICA ENTER THE FRAY

by Matthew Rothenberg, MacWeek

Once in the domain of prepress operations and publishing pros, film scanners are now finding a new focus: small-office, home-office (SOHO) photographers.

Camera heavyweights

Olympus America (516/844-5000, www.olympus.com/digital), Minolta U.S.A. (201/825-4000, www.minoltausa.com), and Konica U.S.A. (201/568-3100, www.konica.com) recently unveiled sub-\$1,000 devices designed to speed the transition from film to desktop for SOHO users.

The new contenders can handle 35mm slides and negatives as well as Advanced Photo System (APS) film, a new, smaller standard for commercial film stocks. Each SCSI device is based on a trilinear CCD array and captures color or black-and-white images in a single pass.

Olympus Debuts Olympus is taking its first shot at the scanner market with the \$499 ES-10 SCSI. The device, scheduled to ship in December, captures 35mm images at 2,400 by 1,600 pixels. It can scan 24 bits of RGB data per pixel; Olympus says the ES-10 can capture a 35mm original in as little as 30 seconds.

The 3-pound scanner measures 5.1 by 3.9 by 9.3 inches. It includes a variety of consumer software packages, including Adobe PhotoDeluxe; InMedia Presentations' Slides & Sounds Plus; and Olympus Pictra Album, the company's image-cataloging software.

Users who want to process APS film with the ES-10 can purchase Olympus's \$199 A-10 adapter. A parallel version of the ES-10 costs \$449.

Minolta's Shot Minolta offers the Dimâge Scan Dual, an \$895 device that captures 35mm or APS originals at an optical resolution of 2,336 by 3,504 pixels or 1,776 by 2,928 pixels, respectively. It captures 30 bits of RGB data and scans a 2,400-dpi 35mm or APS original in about 60 or 56 seconds, respectively, Minolta says.

The Dimâge Scan Dual weighs in at 4.4 pounds and measures 3.6 by 6.3 by 10.7

inches. The scanner is bundled with Adobe PhotoDeluxe and an Adobe Photoshop scanning plug-in.

Konica Cues Konica recently shipped the Qscan QS-1202U Film Scanner, a \$799 device that also handles 35mm and APS film.

The Qscan offers an optical resolution of 1,200 dpi for either type of film. It scans 24 bits of RGB information per pixel; Konica says the Qscan can capture a 35mm or APS original at top resolution in about 70 or 50 seconds, respectively. It weighs about 4.8 pounds and measures 4.8 by 5.6 by 11.8 inches.

Like its competitors, the Qscan is bundled with Adobe PhotoDeluxe. It also includes ImageAXS, a cross-platform image-cataloging package from Digital Arts & Sciences.

LEANDER KAHNEY of MacWeek contributed to this report.

online

WebStar 3 to Gain FTP, Proxy Servers

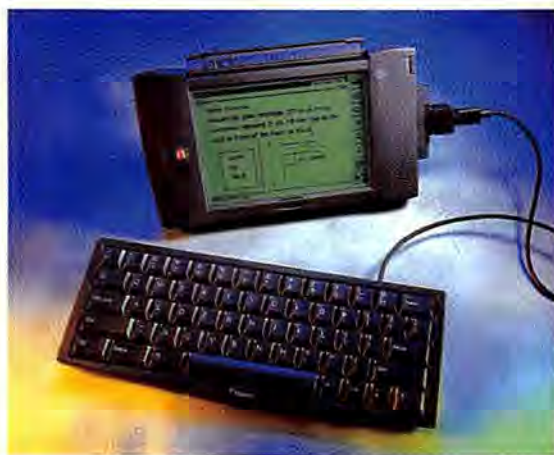
STARNINE PLANS 1998

RELEASE FOR UPGRADE

by Joanna Pearlstein, MacWeek

The most popular Macintosh Web server is expected to gain a host of new capabilities when version 3.0 arrives in early 1998. Sources say that StarNine (510/649-4949, www.starnine.com), a division of Quarterdeck, is preparing an upgrade to WebStar that reportedly will offer FTP capabilities and support multiple domains, so that a single server can, for example,

continues



Apple Updates the MessagePad

Limited RAM means limited productivity, whether you have a desktop system or a PDA. Apple Computer (408/996-1010, www.apple.com) has given its MessagePad a boost with extra memory and updated software. The MessagePad 2100 includes 4MB of DRAM, 3MB more than the MessagePad 2000. AllPen Software's NetHopper 3.2 Web browser, which is bundled with the MessagePad, now supports authentication, letting users access password-protected Web sites. And you can connect your MessagePad to a LAN with the upgraded Newton Internet Enabler 2.0. The MessagePad 2100 is available now for an estimated \$1,000.—KEITH MITCHELL

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WebStar 3.0's FTP and proxy servers reportedly will be implemented as WebStar plug-ins. The proxy server will provide a collection of security features: Administrators can route all Internet traffic through a single TCP/IP address to guard against hackers, and they can specify which sites users can access. The server will also cache frequently accessed sites, sources say.

New Search Engine The upgrade is expected to include a search engine based on the Apple Information Access Toolkit, formerly known as V-Twin. The software will be able to extract text from Portable Document Format files, according to sources.

A rewritten WebStar Admin application will provide better remote-administration features, according to sources. The new version will work over TCP/IP and AppleTalk so that Web masters can manage a Web server and its plug-ins from anywhere on the Internet. The TCP/IP connection is expected to be encrypted for additional security.

Open Transport Ties WebStar 3.0's multihoming capabilities will reportedly be tied to the forthcoming Open Transport 1.3, a revision to Apple's networking architecture that is expected to ship with Mac OS 8.1 around the end of the year.

Currently, WebStar can host multiple servers through external CGIs or through plug-ins such as Jon S. Stevens's ClearlyHome, Open Door Networks' HomeDoor, and ClearWay Technologies' FireSite Virtual Domain Manager. With WebStar 3.0 and Open Transport 1.3, Web masters can host multiple servers with different TCP/IP addresses on a single machine.

New PowerPC-native code in Mac OS 8.1 will also provide some "serious" speed improvements for WebStar 3.0, sources say.

The upgrade's registry for server-side includes (SSI) tags will reportedly help WebStar plug-ins work together more efficiently. According to sources, developers will be able to write SSI extensions for their plug-ins; then sites will be able to call on multiple plug-ins on a single Web page.

Version 3.0 will also come with StarNine's WebObjects Adapter, which helps WebStar to communicate with Apple's WebObjects.

Sources say StarNine hopes to have the upgrade shipping around Macworld Expo in January. StarNine declined to comment.

online

XML Ascends on the Web

NEW WEB AUTHORING

STANDARD OFFERS

ADVANTAGES OVER HTML

by Stephen Beale

Move over, HTML; there's a new Web authoring standard in town. The eXtensible Markup Language (XML) is beginning to gain steam as a more powerful alternative to HTML. Netscape Communications and Microsoft have both pledged to support XML in their browsers, and a handful of vendors have announced they will add XML capabilities to their Web authoring packages. While XML will probably not replace HTML, many believe that it will eventually become the format of choice for complex, data-driven Web sites.

But what is XML, and what are its advantages over HTML? The answers go back to the technology that spawned both acronyms:



Standard Generalized Markup Language (SGML).

SGML Demystified SGML is a standard for document markup—first established in 1986—that has become popular in certain high-end-publishing niches, such as production of aircraft-maintenance manuals and federal-government reports. It uses <tags>—codes contained within angle brackets—to identify the parts of a document. The tags you can use in a document, and the rules for using them, are defined in a *document type definition* (DTD) file.

SGML's use of tags should sound familiar to HTML authors, because HTML is based on SGML. HTML 2.0 and HTML 3.2, the official standards supported by the World Wide Web Consortium (W3C), are DTDs that describe the tags that can be used within Web documents. In most SGML applications, the DTD is a file separate from the actual document. With HTML, the information that would otherwise be included in a DTD is coded into your browser.

The XML Advantage HTML provides a simple means of defining how information is presented on screen,

but it has many limitations. XML, developed over the past year and a half by a working committee of the W3C, was designed to offer more power and flexibility than HTML while being easier to use than SGML.

Unlike HTML, which has a defined set of tags, XML is extensible, meaning that you can create your own document descriptions or use XML DTDs created by others. In addition to inserting tags to provide formatting instructions, you can also use them to identify what type of information is being presented: a person's name can be tagged as "name," address as "address," and so on. This makes it possible to handle chunks of text as if they were fields in a database.

Other Goodies In addition to the language, XML technology has two other components that enhance its power and flexibility: XML-Link and XSL.

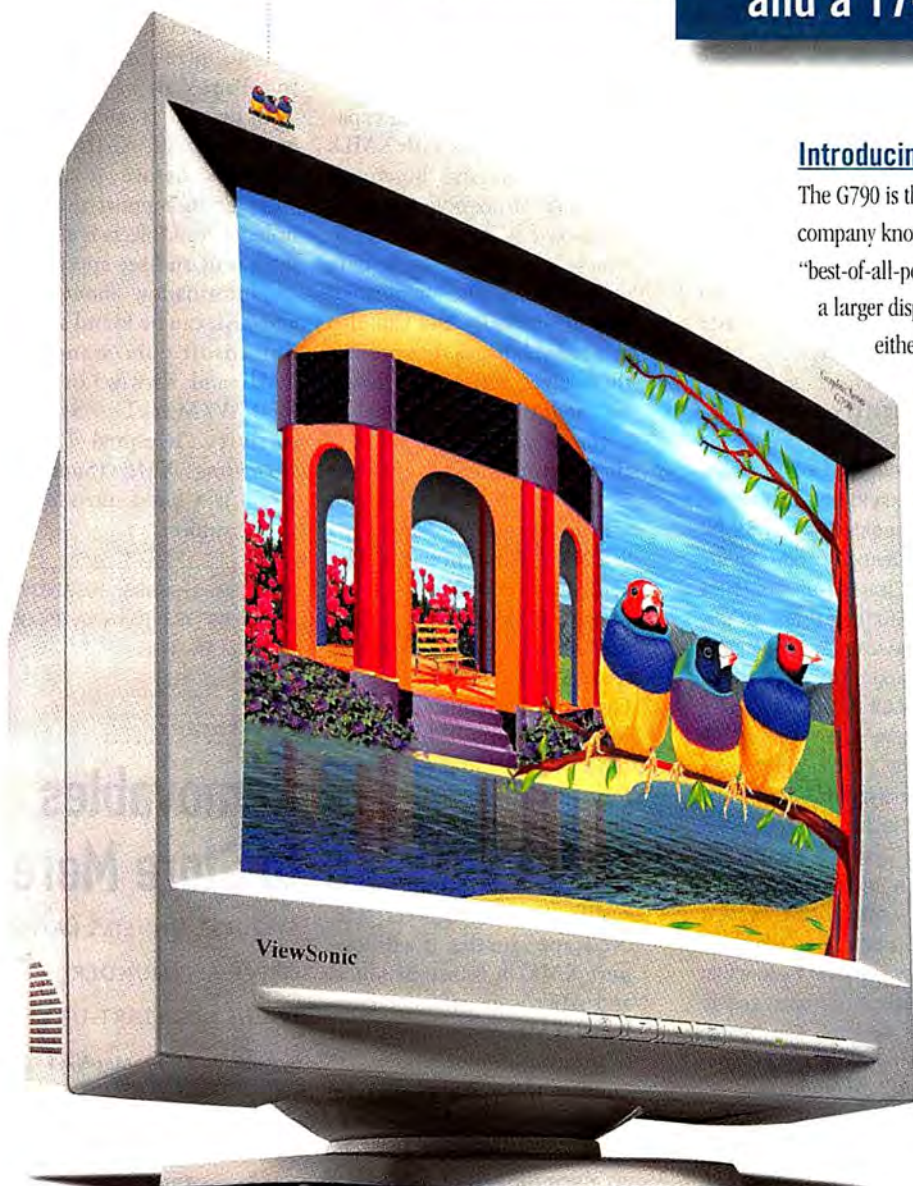
XML-Link offers linking capabilities that go far beyond those supported in HTML. A single link can connect to one of several targets, depending on conditions established by the Web author. For example, a link could send a user to introductory or advanced information on a certain software product, depending on that person's level of expertise. When connecting to another XML document, you can also set up the link to show only a specified portion of the page.

XSL, the XML stylesheet language, is an evolving standard; Microsoft, Inso, and ArborText recently submitted an XSL specification for consideration by the W3C. As proposed, the standard would be based on the Document Style Semantics and Specification Language (DSSSL), which is used to format some

continues

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MORE JADE FROM LINOTYPE

Linotype CPS (formerly LinoColor; 516/434-2000, www.linocolor.com) has added another precious stone to its product line, with the LinoColor Jade2, a 30-bit flatbed scanner that offers 600-by-1,200-dpi optical resolution. Priced at \$449, the scanner includes Xerox TextBridge for

(512/795-2978, www.powerlogix.com). The card comes in two speeds, 250MHz, for \$2,199, or 275MHz, for \$2,799. Both include a 1MB backside cache and an adjustable bus speed. The cards work with any Apple Mac or clone made within the last two years with a processor slot, PowerLogix says.



The Jade2 offers 600-by-1,200-dpi resolution.

optical character recognition and VisualLab EZ, a simplified version of Linotype's scanning and color-correction software. An optional transparency adapter costs \$295. Linotype also announced that it has reduced the price of its LinoColor Saphir Ultra scanner from \$5,495 to \$3,495.

SCANNING ON A BUDGET

They can't get much cheaper than this: the new Astra 610S flatbed scanner, from Umax (510/651-4000, www.umax.com), offers 30-bit color depth, 300-by-600-dpi optical resolution, and an 8.8-by-11.7-inch scanning area for \$149. Bundled with Adobe's PhotoDeluxe image editor and NewSoft's Presto! PageManager OCR software, the scanner is Twain-compliant and uses a SCSI-2 interface to connect to a Mac.

POWER FOR OLDER MACS

Envious of the new G3 systems? If you've got an older Mac or clone, you can still take advantage of the latest PowerPC CPU, thanks to the PowerForce G3 upgrade card, from PowerLogix

in addition, the \$130 program now expands encrypted Zip files and Private File archives.

Spring Cleaning 2.0, the latest version of Aladdin's \$120 uninstaller utility, boasts a new interface, Stuffit compression, and a Duplicates Remover feature that lists all duplicated fonts and/or files on a system. The Search Results window now includes more detailed file information.

NOT FOR THE CAMERA-SHY

If you just want to dabble with mini-DV, stay away from the new XL1, from Canon (516/328-5000, www.canonv.com). Designed for professionals and semi-professionals, the \$4,699 camera has three audio-recording modes and three video modes, one of which lets you take still digital photos. It accepts Canon's XL video lenses and, with an optional adapter, EOS 35mm camera lenses. Other features include a one-push autofocus button, manual focus control, 16x zoom, and an optical image stabilizer that prevents the picture from shaking.—KEITH MITCHELL

UTILITY PLAYERS

Aladdin Systems (408/761-6200, www.aladdinsys.com) has updated its Stuffit Deluxe and Spring Cleaning utilities. New Stuffit features include Mac OS 8 compatibility and e-mail support for AOL 3.0, Claris EMailer, and Lotus cc:Mail. In

SGML documents. DSSSL, in turn, is based on a programming language called Scheme, and it thus offers capabilities that go beyond text formatting.

XSL's programming capabilities, combined with XML's enhanced tagging functions, will make it possible to create Web-based applications in which you can re-sort data after it has been downloaded to your desktop. You can also create Web pages that present themselves differently, based on the user's preferences. For example, you can create a tag that automatically enlarges headlines for users with impaired vision.

XSL incorporates the HTML Cascading Style Sheets (CSS) feature, implemented in the latest browsers from Microsoft and Netscape Communications. Because XML supports the HTML style sheets, you'll be able to format relatively simple XML documents by using CSS.

XML Tools At present, XML is more promise than reality. On the browser side, Netscape says that it will support XML in future products and Microsoft offers a Java-based XML processor as part of Internet Explorer 4.0.

On the authoring side, you can use any text editor to create XML content. However, given the complexity of the XML language, most users will prefer dedicated authoring tools. The first XML authoring software will likely be based on existing SGML applications, which simplify document creation by presenting the appropriate tags and ensuring that you adhere to the formatting rules specified in the DTD. Unfortunately for Macintosh users, the majority of SGML authoring software runs on PCs or Unix workstations.

Among Mac developers, Adobe Systems says that it will

support XML in a future version of FrameMaker, which has long offered SGML support. However, the company has no plans to add XML to PageMill. Macromedia says that it is awaiting the emergence of XML-capable browsers before it decides whether to support the technology; NetObjects is also taking a wait-and-see approach.

Information about XML and XSL can be found at www.microsoft.com/standards/XML and www.w3.org/pub/WWW/Markup/SGML/Activity. Richard Light's *Presenting XML* (SamsNet, 1997) is a good introduction to the subject.

Additional reporting by ANDREA DUDROW and JOANNA PEARLSTEIN of *MacWeek*.

storage

Removables to Store More

SYQUEST UNVEILS LATEST DRIVE AS FOUNDER LAUNCHES START-UP

by John Poultney, *MacWeek*

SyQuest Technology (510/226-4000, www.syquest.com), in an effort to revive its fortunes in the removable-storage market, used the recent Comdex/Fall trade show to roll out its highest-capacity drive. Meanwhile, Castlewood Systems (510/224-9900), a new company from SyQuest founder Syed Iftikar, has introduced a \$199 storage device with removable 2.16GB cartridges.

SyQuest for DVD SyQuest's latest is the \$599 Quest, a 4.7GB drive that was due to ship in December. The

continues

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Media WATCH

BY MACWEEK STAFF

Images on a Diet Putting the squeeze on images, Geo Publishing (602/902-5913, www.emblaze.com) has released Emblaze WebCharger, a \$99.95 utility for compressing images for use on the Internet. According to Geo, WebCharger will compress 16- or 24-bit graphics up to 400 percent more than JPEG. The application can import and compress images in JPEG, GIF, BMP, or PICT formats.

Geo says its compression scheme allows images to load rapidly on Web sites without requiring a special plug-in. Users can select specific regions of an image for maximum compression, so that image quality is preserved in the remaining areas. They can also control compression ratios. A bandwidth-simulation monitor helps users optimize images for specific modem speeds.

Ray Gun Targets Digital Noise A ray gun did the job on Flash Gordon's space villains, and Arboretum Systems (415/626-4440, www.arboretum.com) says that it can reduce noise in digital recordings, too. The company's \$99 Ray Gun acts as a real-time sound processor. Users listen to an audio stream and apply controls to reduce or remove noises, including hums, rumbles, pops, and clicks. Once an acceptable result is achieved, the sound is processed into a new file. The program works as a stand-alone application or as a plug-in for Adobe Premiere or other programs that can handle Premiere plug-ins. The software includes a "learning" mode for automatically detecting and deleting noise elements, Arboretum says.

Based on technology from Arboretum's Ionizer sound-processing program, Ray Gun runs on any PowerPC-based Macintosh and does not require additional hardware, according to the company.

Sony Heats Up FireWire Video Sony Electronics (800/686-7669, www.sony.com/professional) is warming up a tiny video camera that taps into the FireWire serial-bus protocol. The DFW-V300 is scheduled to ship in February 1998 for about \$1,000. The camera will achieve data-transfer rates as high as 200 Mbps when connected to a FireWire board, according to Sony.

The DFW-V300 will capture sequences at 30 frames per second; its half-inch-wide CCD array, based on Sony's Hole Accumulated Diode technology, will handle resolutions of up to 640 by 480 pixels. For less-demanding applications, the camera will also support frame rates of 3.75, 7.5, and 15 fps. The 7-ounce camera will measure about 4 by 1.75 by 1.75 inches. It will include an industry-standard C mount, which Sony says will let users attach a variety of photographic lenses. The device will ship with a Mac driver; it will not include a viewfinder.

Ultra SCSI drive ships with one 5.25-inch cartridge; additional cartridges cost \$199 each. The drive provides a maximum sustained data-transfer rate of 10.6MB per second and an average seek time of 11 milliseconds.

The Quest's 4.7GB capacity is no coincidence, says analyst Jim Porter, president of Disk/Trend: it's the same as that of DVD media. "What's been lacking in multimedia-authoring circles is a removable that can be used in developing titles for DVD," he says.

Syed Returns Meanwhile, SyQuest founder Iftikar has introduced the Orb, the first product from his start-up company, Castlewood Systems. The \$199 drive uses proprietary 3.5-inch cartridges with a capacity of 2.16GB each. The media cost \$29.95 each.

Iftikar says the drive offers a sustained data-transfer rate of 12.2MB per second and an average seek time of 12 milli-

"MACS AND NT: ALLIES OR ADVERSARIES?"

continued from page 25

ware such as Netscape Communicator's e-mail client will be able to access it.

Macs will be able to take advantage of distributed applications, such as Internet shopping catalogs, that can be created with Windows NT Server's built-in transaction services. Hierarchical storage management will enable the automatic archiving of data into such offline repositories as DATs or jukeboxes; NT will also make it easy to remount the stored volume whenever you need it.

Active Server Pages technology, which was added after 4.0 and will be rolled into 5.0, makes it easy to build platform-independent Web applications by using scripts that combine HTML, Java, or any other scripting language. In version 5.0, this technology

will be enhanced to support multisite hosting and system administration on a site-by-site basis.

Another eagerly awaited feature is plug-and-play, which makes it easier to connect peripherals and get them to work on the first try.

The computer interrogates a newly connected device and then automatically loads the correct driver and configures the settings—a process that works not only when you initially install Windows NT Server (as it does in 4.0) but also when you add devices to a server after the initial installation.

The Mac Holds On Trend-Watch, a market-research firm that tracks the buying patterns of creative professionals, reports a 4 percent decline in Mac purchases and a slight

continues



Castlewood's Orb uses 2.16GB cartridges.

seconds. Slated to ship in the first quarter of 1998, the Orb includes a set of formatting and storage-management utilities called Orb-it Tools.

Both companies say that the magneto-resistive head technology used in both drives precludes compatibility with the lower-capacity media used in current drives. The Quest does not read or write older 5.25-inch SyQuest cartridges, and Castlewood says that the Orb does not handle media designed for drives from SyQuest or Iomega.

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increase in use of PC workstations over the last year and a half. However, the company says that creative professionals planning to buy Macintosh systems in the next year still greatly outnumber those switching to PCs; only about 2 percent of those surveyed said they plan to replace their Macs with PC systems.

Nevertheless, Windows NT is not going away as an issue for Mac-based sites to consider. The good news is that the migration to NT Server is not necessarily a death knell for the Mac. Beyond Windows NT Server's improved Mac support, forthcoming products—such as Thursby's Dave 2.0 and Miramar Systems' PC MacLAN for Windows NT (see "Keeping Up with NT," in this section)—will extend compatibility between Macs and Windows PCs and give Mac loyalists more ammunition for defending their platform of choice.

cross-platform

Keeping Up with NT

THREE PRODUCTS MAKE IT EASIER FOR MACS AND PCS TO COEXIST

by Cathy Abes

As Windows NT servers and workstations show up on corporate and creative desktops, such products as Thursby Software's Dave, Miramar Systems' PC MacLAN, and Intergraph's ExtremeZ workstations are helping bridge the feature, compatibility, and performance gaps between Macs and PCs.

Dave 2.0 Thursby Software's (817/478-5070, www

.thursby.com) Dave and Miramar Systems' (805/966-2432, www.miramarsys.com) PC MacLAN for Windows NT both provide connectivity and file-sharing features for Macs and PCs. However, they focus on opposite ends of the spectrum. Dave 1.0, available since November 1996, is geared toward Macs that need to join a PC network. A Mac running Dave not only becomes a client of a Windows NT server but can also access machines running NT, Windows 95, or Windows for Workgroups (Windows 3.1x).

Dave 2.0, due to ship by early January (\$119 through February; \$149 thereafter; free upgrade for 1.0 owners), will give Macs access to most NT Server features, bringing Macs closer to parity with PC clients. Bidirectional connectivity will enable PCs on the network to access Mac files and print services. Other new features include AppleScript support, password encryption, and the ability to use a single log-in to access all network resources within an NT security domain.

PC MacLAN for Windows NT While Dave brings Macs into the world of PCs, PC MacLAN for Windows NT is designed to integrate an NT workstation into an existing network of Macs. Like Dave, it offers bidirectional file and resource sharing between Macs and PCs. But it also adds AppleTalk support (already built into NT Server 4.0) to NT Workstation, allowing it to function as an AppleShare server. And PC MacLAN lets Macs access all drives and volumes on either an NT workstation or server, not just those configured in NTFS format, as is the case with NT Server alone.

PCs running PC MacLAN for Windows NT will be able to print to any PostScript or AppleTalk printer on the network, while Macs will be able to use non-PostScript

printers that have the right drivers installed. And PCs will have access to the Mac's print-status features, informing them about a print job's progress as soon as the job is sent.



Intergraph's ExtremeZ is an NT workstation designed to blend into a Mac environment.

Due to ship in December 1997, PC MacLAN for Windows NT will sell for \$249.

ExtremeZ With its ExtremeZ Graphics Workstation 2D, Intergraph (205/730-5441, www.intergraph.com/ics/) is out to convince Mac creative professionals to bring high-powered plug-and-play NT machines into their stable of Macs. Designed for easy integration, the ExtremeZ connects to an AppleTalk network

and can access Mac media.

Due in early January, the ExtremeZ comes with either one or two 300MHz Pentium II CPUs, a minimum of 64MB of memory (expandable to 512MB), and a 4GB SCSI-3 drive. Other features include Ultra Wide SCSI and SCSI-2, 10/100 Ethernet, two serial ports, 16-bit audio, 512K of cache, and a 24x CD-ROM drive. Internal Iomega Zip and Jaz drives are optional.

The ExtremeZ offers four pre-configured software packages. The Connectivity bundle consists of Adobe Type Manager, DataViz MacOpener, Miramar's PC MacLAN for Windows NT, and ColorSolutions' color-management software. The Creator package adds QuarkXPress 4.0 and MetaCreations' Painter 5, Kai's Power Tools, and KPT Convolver. The Designer bundle substitutes Adobe Photoshop 4.0 for QuarkXPress. The Pro package adds ColorSolutions' ICC Batch, ICC Edit, and Viewer, for device profiling.

A Mac Shop Makes Room for NT

MANN CONSULTING, A SAN FRANCISCO-BASED MULTIMEDIA-development company, is firmly committed to the Mac but decided to add NT Server a year ago. The network consists of two Macs running AppleShare and one PC running Windows NT Server 4.0.

According to principal Alex Mann, the company's AppleTalk performance is excellent when running under Windows NT Server's built-in Services for Macintosh (SFM). Mann also appreciates the NT server's ability to function as both Mac volume and FTP site.

Because customers and off-site employees can access the server via the Internet without having to upload to a separate FTP site, they don't have to enter passwords or remember multiple user IDs. They simply mount the appropriate volumes and folders, which are shared by Windows as well as Mac clients.

Mann admits that the NT server was much harder to set up and administer than AppleShare. But he believes that its advantages, including the low cost, have made it worth the trouble.—CATHY ABES

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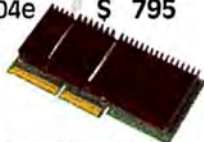
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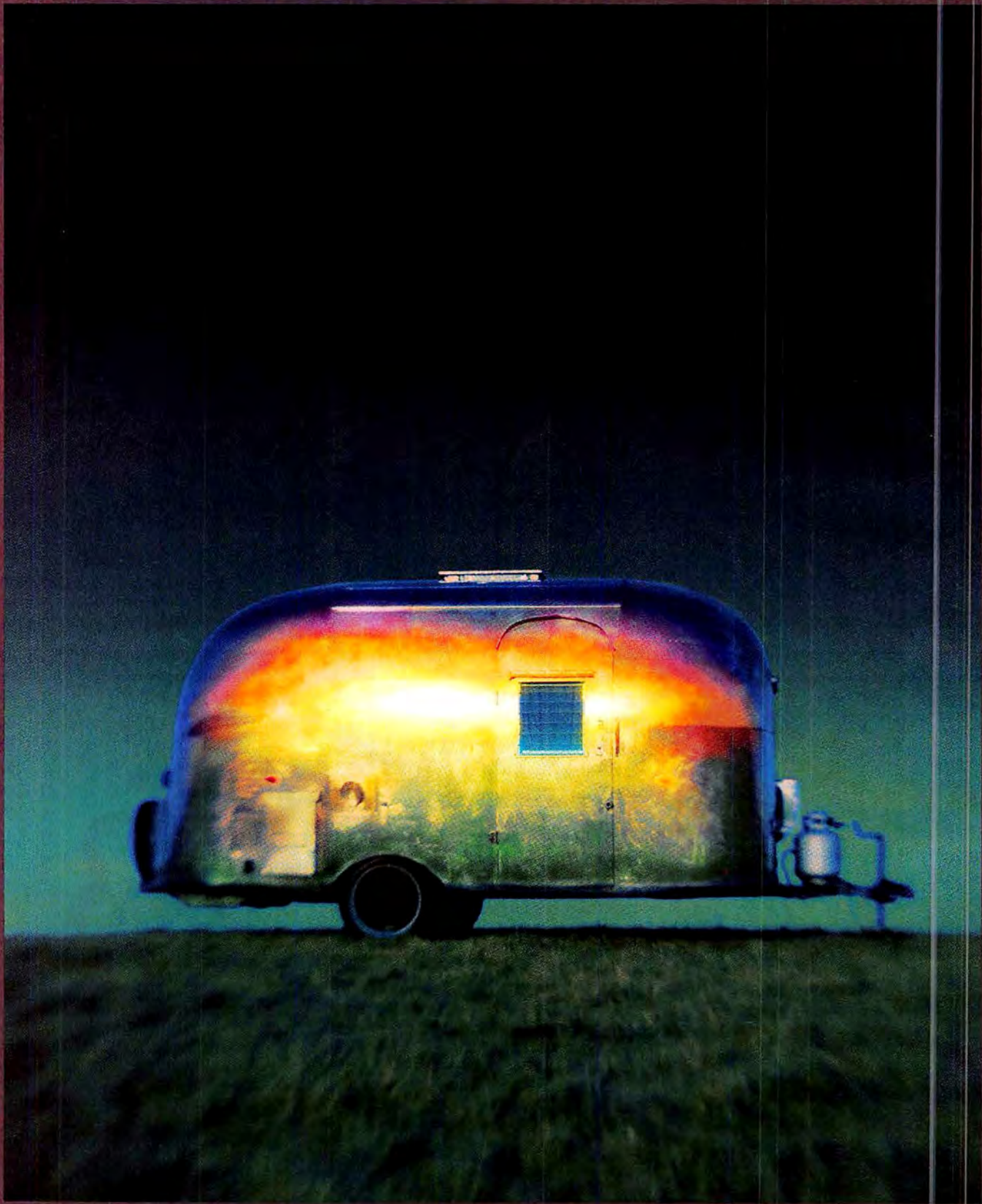
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Reviews

FileMaker Pro 4.0

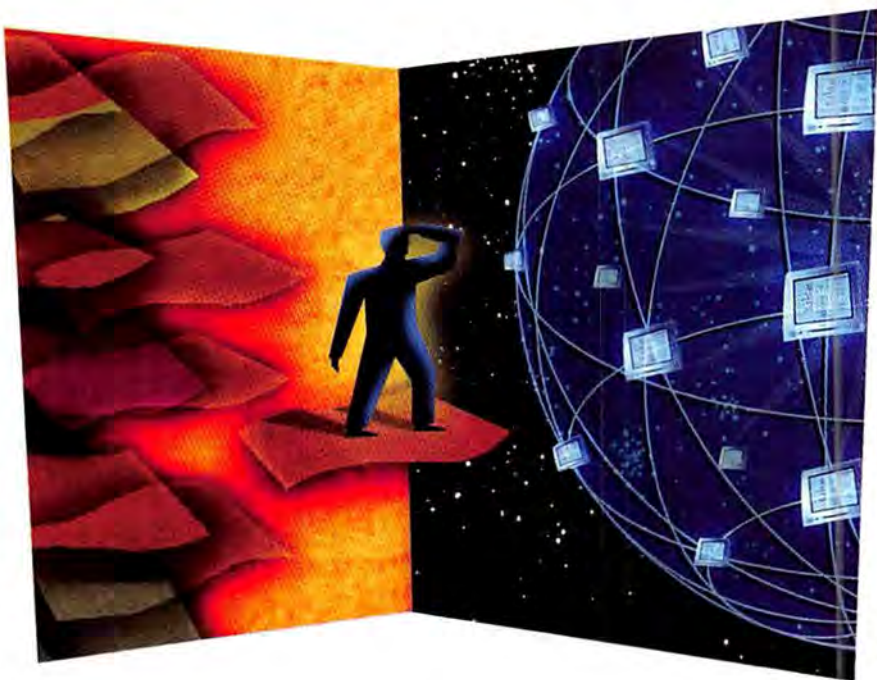
DATABASE MANAGER GAINS
EASY WEB PUBLISHING,
ENHANCED LAYOUT TOOLS

FILEMAKER PRO AND WEB SITES aren't strangers to each other, but until now, putting them on speaking terms has required buying and mastering a third-party database-publishing product (see "Online On Time," April 1997). Claris FileMaker Pro 4.0 changes all this by providing the easiest database-publishing features in existence. If you can click on a check box, you can make your FileMaker Pro database available to the world or to the office—no additional software, no special coding. (For a hands-on look at these new Web publishing features, see "FileMaker Hits the Web," December 1997.)

If you've been longing to Web-enable a database but have dreaded grappling with third-party database-publishing utilities, FileMaker Pro 4.0 is a dream come true. If you already bear the calluses of a database-publishing product, the latest FileMaker Pro may not excite you as much—although you'll still find appealing enhancements that streamline the Web/database connection in other ways. And if you're a FileMaker Pro veteran, you'll find an array of mostly minor but still-welcome tweaks.

Different but the Same

FileMaker Pro 4.0's basic features are nearly identical to its predecessor's, but



there are some welcome additions. Version 4.0 can directly import Microsoft Excel worksheets—just drag them onto the FileMaker Pro icon, and FileMaker Pro creates a new database, with each spreadsheet row becoming a record.

When creating layouts, you can now rotate fields and labels so that they run vertically. Although you may not use this capability every day, it does allow for more-flexible report and label formatting. When you click within or tab to a rotated field, FileMaker Pro instantly unrotates its contents for easy data entry. Tab to or click in a different field, and

the field will return to its rotated state.

FileMaker Pro 4.0's Find feature now lets you specify an exact search—for example, find towns named *Baker*. Previous FileMaker Pro versions would also find *Bakerville* and *Bakersfield*.

If you use FileMaker Pro's relational features to establish links among different database files, you'll be glad to know that FileMaker Pro can now sort records within a portal (a view into a related file) or within related lists; if you have a class database linked to a student database, you can display the student list sorted by name from within the class database.

REAL PRODUCTS
REAL RATINGS

Reviews you can trust: Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy.

OUTSTANDING: ★★★★★

VERY GOOD: ★★★★

GOOD: ★★★

FLAWED: ★★

UNACCEPTABLE: ★

Net Gains

What's most impressive about FileMaker Pro 4.0 is its Internet savvy. Some of version 4.0's Internet tricks are simple time-savers. For example, if a field contains a URL, you can ⌘-click on the field and FileMaker Pro will bring up the referred page, launching your browser if necessary. FileMaker Pro 4.0 also adds support for GIF and JPEG images, the predominant Web graphics formats. You can store GIF and JPEG graphics within container fields and include them as static images on layouts. Happily, you don't have to convert stored graphics to JPEG or GIF format in order to serve them over the Web. FileMaker Pro's Web Companion server converts graphics stored in other formats into JPEG images on the fly.

FileMaker Pro's Export command now speaks HTML: you can export part or all of a database as an HTML table that you can open and embellish with your favorite HTML editor. If your database changes infrequently, you might find that this new feature is all you need in order to put your data on the Web. And if you want to inform those on your customer list when a page changes, you can use FileMaker Pro's new Send Mail scripting function to automatically send e-mail to addresses stored in a database.

Plug into the Web

FileMaker Pro 4.0 provides a new plug-in architecture that enables Claris and third-party developers to create extensions that add new features. FileMaker Pro 4.0 includes one plug-in: Web Companion, the bridge between FileMaker Pro 4.0 and the Web. Based on the Lasso database-publishing utility, from Blue World Communications (www.blueworld.com), Web Companion provides the features necessary to Web-enable a database, handling the grunt work of blasting bits to the browsers that access your database.

If you're after quick results, you can use Web Companion's Instant Web Publishing mode; its canned screen designs let your site's visitors view, search, and modify the database (see "Webbed FileMaker"). Canned screens are often as interesting as canned soup, but Web Companion's are canned up in several ways. The screens are attractively designed and bear sensibly placed navigation buttons. When visitors view your database using a Java-capable browser, Web Companion downloads a Java applet that looks and works like File-

Maker Pro's book tool (the flip-book icon that lets you page through a database). If visitors hit your site, using browsers that don't speak Java, they will see conventional hyperlinks.

If you prefer to cook up screens from scratch, you can use Web Companion's CDML (Claris Dynamic Markup Lan-



Webbed FileMaker FileMaker Pro's Web Companion provides attractive canned screen designs that let visitors view a database as a table or as a form (shown here). Other screens enable searching, record modification, and data entry. Note the Java-based book tool in the upper left corner.

guage) tags to create format files that access and display databases. With CDML tags, you can create custom-designed screens for searching and manipulating a database. You can also perform advanced tasks, such as using browser cookies to track a visitor's progress through your site.

To develop custom database applications by using CDML, you can alternatively hand-peck tags into a text editor such as Bare Bones Software's BBEdit or employ FileMaker Pro 4.0's CDML Tool, a FileMaker Pro database that streamlines CDML programming. You choose options from a variety of pop-up menus, and CDML Tool generates a format file that you can copy and paste into an HTML editor.

Working with CDML tags is far more complex than using Web Companion's Instant Web Publishing mode. FileMaker Pro includes numerous templates and applications that you can dissect, including guest-book and online-shopping-cart applications, but be prepared for a steep learning curve.

Version 3.0 of Claris Home Page, which is scheduled to ship by the time you read this, promises to streamline CDML tasks; according to Claris, File-

Maker Pro Connection Assistant will create format files automatically.

As for the Web-server half of Web Companion, it supports FileMaker Pro's security and access-privilege settings, so you can assign passwords that, for example, allow all visitors to browse a database but only certain users to modify it. FileMaker Pro 4.0 also provides a separate Web-security scheme. The Web Security database provides finer control over security, enabling you to, for example, hide certain fields from certain visitors.

Macworld's Buying Advice

FileMaker Pro 4.0 is a smart update that enhances FileMaker Pro's overall capabilities while adding red-hot Internet features. Database newcomers and FileMaker Pro veterans alike will be pleased with this program—whether or not they plan to Web-enable their databases.

For Web publishers, the greater question is whether FileMaker Pro obviates the need for third-party database-publishing tools: Lasso; the Tango family, from Everyware (www.everyware.com); and WebFM, from Web Broadcasting (www.webfm.com). For basic database-publishing tasks, there's no need for a third-party utility. FileMaker Pro's Instant Web Publishing feature makes basic searching, browsing, and editing a one-click proposition. Web Companion's CDML handles custom formatting chores and more-advanced data-publishing jobs well, but professional developers will still want to use the combination of a third-party database-publishing product and a general-purpose Web server—a combination that allows for secure transactions, interapplication communications via Apple events, and other advanced tasks.

But this group is tiny compared to the universe of users who simply want to make their FileMaker Pro databases accessible via the Internet or an intranet. For this majority, FileMaker Pro 4.0 is a godsend.—JIM HEID

RATING: ★★★★★ **PROS:** Easy Web publishing; enhanced layout and sorting features; excellent overall Internet support. **CONS:** CDML documentation provided in electronic form only. **COMPANY:** Claris (408/727-8228, www.claris.com). **COMPANY'S ESTIMATED PRICE:** \$199; upgrade, \$99.

Remote-Access Clients and Servers

CLIENTS SHOW MATURITY AND INTEGRATION; SERVERS REMAIN AN ECCENTRIC LOT

CONNECTIVITY TO REMOTE networks used to be easy for Macintosh users—you simply installed Apple Remote Access at both ends and accessed AppleTalk resources at will. These days, though, Mac users generally require access to Internet Protocol (IP)-based services as well; in addition, administrators are providing multi-protocol access to an ever increasing pool of remote users. Thankfully, Macintosh administrators are able to select from a range of recently updated client and server applications that improve both integration and functionality.

Newly updated client applications include Apple's Apple Remote Access 3.0 and FCR Software's LinkUPPP 2.0. Both of the applications offer AppleTalk and IP support over Point-to-Point Protocol (PPP) connections, eliminating the need for a separate PPP dialer. Apple's Apple Remote Access Personal Server 3.0 has additionally been updated; it now allows Apple Remote Access Protocol (ARAP) and PPP connections, albeit with limited flexibility.

For sites that support multiple simultaneous connections, Keyspan and Apple both offer multipoint server solutions. Keyspan bundles its own four-port PCI serial card with Vicom Technology's PPP Server, letting multiple remote clients connect to a TCP/IP network. Apple's Apple Remote Access Multipoint Server remains at version 2.1.1 (no update is currently planned); bundled with either a NuBus or PCI serial card, it offers multipoint ARAP connectivity with improved security.

The Client Side

Both ARA 3.0 and LinkUPPP 2.0 closely resemble their predecessors. ARA 3.0 retains the simple, Spartan, slightly fragmented interface of previous versions, presenting multiple control panels for configuring modem, dialing, network, and connectivity options. One new twist is the appearance of a configurations dialog box à la the TCP/IP control panel—ARA no longer saves settings in double-clickable documents. While ARA 3.0 is eminently usable, LinkUPPP 2.0 is both better integrated and more attractive; it

lets you configure all connectivity and modem settings in a single window and saves settings in connection documents.

Like previous versions, ARA 3.0 incorporates the basic features necessary for remote access. Users can specify dialing options, connection reminders, log levels, and third-party alternatives for security. It comes with a wider range of scripts for modems, including 56-Kbps and ISDN. But the big difference is support for PPP connections: users can configure ARA to employ either ARAP or PPP when connecting, or they can have ARA automatically negotiate the protocol. PPP connections can be initiated



Classic Interface ARA 3.0 retains the simple, multiple-control-panel interface of previous versions.

automatically when TCP/IP is started, can use hardware compression and error correction (ARAP does this in software at a significant performance penalty), and can use a terminal window or saved log-in script to interact with command-line hosts. PPP connections allow AppleTalk traffic as well as TCP/IP traffic when the host supports AppleTalk Control Protocol (ATCP), and ARA 3.0 still supports ARAP connections for older AppleTalk-only servers. ARA 3.0 requires Open Transport 1.1.1; System 7.1, 7.5.3, or later; and a 68030 or better processor.

LinkUPPP 2.0 sports all the cool features of version 1.1, including outstanding diagnostics windows, a wide range of modem scripts, AppleTalk and IP over PPP, serial-line Internet-protocol (SLIP) support, and configuration options that closely match ARA's. Version 2.0 adds AppleTalk bridging—which lets you print to local AppleTalk printers while you're connected to a remote network—along with a variety of interface tweaks. Unlike

ARA 3.0, LinkUPPP does not support ARAP connections and provides AppleTalk services when the user is connected to ATCP-capable hosts. The program runs on an SE or better with System 7 and MacTCP or Open Transport.

I tested both clients on a Umax SuperMac S900/233 (running Mac OS 8 and with a Global Village Teleport 33.6-Kbps modem) and on a Performa 6400/200 (running System 7.6.1 and with an internal 28.8-Kbps Apple Express modem). I connected to a variety of hosts, and both clients worked reliably; the only exception was a crashing bug on the S900 when I selected the wrong Global Village script for LinkUPPP. Both clients connected to every server (ARA also connected via ARAP to an internal remote-access server), supported both IP and AppleTalk over PPP, and handled automatic connection and reminder duties with no problem.

Performance testing showed LinkUPPP to be consistently faster than ARA for all types of connections and exposed some oddities in ARA's performance. When I was connected to the Internet, LinkUPPP was slightly faster than ARA for large FTP downloads; oddly, though, when ARA automatically negotiated the PPP connection (instead of being explicitly configured for PPP), performance dropped by nearly 20 percent. When I copied files to and from an ARA 3.0 server, LinkUPPP was again slightly faster than ARA using either PPP or ARAP.

I had another surprise when I connected to the ARA 3.0 server and exchanged files with an AppleTalk host on the remote network: PPP connections with ARA were nearly 30 percent slower than ARAP connections; LinkUPPP was about 10 percent faster than the ARAP connection. Clearly, LinkUPPP offers superior performance in all cases, and ARA 3.0 users will need to configure their connections carefully to avoid serious performance problems.

The Server Side

For those without existing hardware remote-access-server solutions (such as a Shiva LanRover), using ARA Personal

Server 3.0 remains the easiest option around. Basically the 3.0 client with an Answering dialog box and integration with the Users & Groups control panel, ARA Personal Server is easy to use and, at \$130, relatively inexpensive.

Users can configure ARA Personal Server to place time limits on connections, dictate whether remote clients can access only the server or the entire remote network, and take advantage of ARA's new PPP capabilities to let PPP clients connect. Remote clients can use their own IP address or let the server assign one; unfortunately, ARA doesn't support remote-client addressing via the Dynamic Host Configuration Protocol (DHCP). You use the Users & Groups control panel to designate which users can connect to the server and optionally enter callback numbers for individual users. Unlike some other remote-access servers, however, ARA Personal Server doesn't allow users to specify whether a callback is desirable.

Serial-Card/Server Combos

The Keyspan PPP Server and Apple's ARA Multiport Server are quite different from ARA Personal Server—and from



New and Improved LinkUPPP 2.0 places all configuration information in one dialog box and diagnostic information in others.

each other, for that matter. Both come bundled with the Keyspan four-port PCI serial card (ARA can also use NuBus serial cards) to support multiple simultaneous connections, and you can expand either by installing additional cards, but that's where the similarity ends.

The Vicom PPP Server software, bundled with the Keyspan server, is full-featured and PPP-only; it supports DHCP addressing for remote clients, RIP routing between server ports, multihoming (multiple IP addresses on multiple ports), extensive port diagnostics, and security via RADIUS and Users & Groups. The server software supports

File Sharing as well as AppleShare Users & Groups files but not third-party security mechanisms such as TACACS and Kerberos. You can set protocol support, authentication, time and access restrictions, and idle time-outs for each port.

Notably, the Vicom server software offers SLIP and MacIP support as well as PPP, and you can use ports to dial out as well as in. Overall, the product is considerably more complex—and generally more powerful—than the ARA servers. Open Transport, System 7.5.5, and a PCI-equipped Macintosh are required.

ARA Multiport Server 2.1.1 is a holdover from the AppleTalk-only days at Apple and supports only ARAP connections. Bundled with a PCI or NuBus serial card, it's the only Mac-based multiport solution for AppleTalk remote access. Unlike Apple's Personal Server, the Multiport Server is actually a full-blown application as opposed to a collection of control panels. Configuration is straightforward, though, and not much more demanding than configuring the Personal Server. ARA Multiport Server doesn't work with Personal File Sharing; it uses the AppleShare 4.2.X format for its Users & Groups information. When installed on an AppleShare 4.2.X server, it shares account information with the file-server application.

Multiport Server surpasses Vicom's security options by allowing restrictions on password length, password age, and failed attempts to connect to the server. It also lets the administrator configure, on a per-port or per-user basis, access to specific zones on the host AppleTalk network. ARA Multiport Server runs on any Macintosh with System 7.1 or 7.5 or later and is incompatible with AppleShare 5.0.

I installed all three servers on the S900/233 equipped with Global Village modems (one for Personal Server, four for the multiport products), and all performed without incident. Personal Server accepted ARAP and PPP connections and handled time and security restrictions well, while both multiport products were able to handle multiple connections and access restrictions. For informal, single-user access, ARA Personal Server is tough to beat; the multiport products are limited by their single-protocol orientation.

Macworld's Buying Advice

For those who are looking to get connected, both ARA 3.0 and LinkUPPP 2.0

are good solutions. ARA remains a must for connecting to legacy ARAP servers, while those connecting to ATCP-capable PPP servers will prefer LinkUPPP's superior performance and diagnostics.

ARA Personal Server 3.0 provides basic multiplatform remote access with minimal fuss and cost. Although Keyspan's PPP Server offers good functionality at a very reasonable price and ARA Multiport Server 2.1.1 provides capable multiport AppleTalk access, administrators should consider hardware alternatives, which tend to support both protocols and offer greater scalability.—W. DAVIS

ARA 3.0

RATING: **★★★★** **PROS:** Simple to use; multi-protocol support. **CONS:** Too many control panels; performance oddities. **COMPANY:** Apple Computer (408/996-1010, www.apple.com). **LIST PRICE:** \$60.

ARA Multiport Server 2.1.1

RATING: **★★★★½** **PROS:** Supports multiple simultaneous connections; additional security options; relatively easy to configure. **CONS:** No File Sharing support; no PPP support; no current update. **COMPANY:** Apple Computer (408/996-1010, www.apple.com). **LIST PRICE:** PCI version, \$999; NuBus version, \$799.

ARA Personal Server 3.0

RATING: **★★★★½** **PROS:** Simple to use; multi-protocol support; good value. **CONS:** Too many control panels; single-port only. **COMPANY:** Apple Computer (408/996-1010, www.apple.com). **LIST PRICE:** \$130.

LinkUPPP 2.0

RATING: **★★★★½** **PROS:** Multiprotocol support over PPP; extensive diagnostics; good performance. **CONS:** No ARAP support. **COMPANY:** FCR Software (617/494-1300, www.fcr.com). **LIST PRICE:** \$69.95.

PPP Server

RATING: **★★★★** **PROS:** Comprehensive PPP routing; DHCP support. **CONS:** No AppleTalk support; no third-party security. **COMPANY:** Keyspan (510/222-0131, www.keysan.com). **LIST PRICE:** \$529.

YoYo Professional

ISDN TELECOMMUTING THAT WORKS

MOST ISDN TELECOMMUTING devices are strong on data but weak on voice. Big Island's new YoYo Professional excels in both departments, offering fast ISDN Internet access as well as sophisticated ISDN call-control features such as hold, three-way calling, and call transfer. The YoYo Pro also inherits the excellent call-management features of YoYo 1.2 (see *Reviews*, November 1996), letting you identify and filter callers, maintain phone logs, and place calls from the desktop.

Easy Setup

On the hardware side, the YoYo Pro's PCI card is compatible with both Mac and PC systems; it sports an ISDN phone port, two analog phone ports, a status light, and an external power supply. You plug one or two phones—or a phone and fax machine or modem—into the analog ports and treat them as two separate phone lines, each with its own unique phone number. The external power supply lets the YoYo Pro continue to provide analog phone service even when your Mac is powered off. Because you can install as many YoYo boards (or Boogie-Boards, their predecessors) as your Mac will accommodate—five for a Power Mac 9500—you can turn your Mac into a miniature telephone switchboard. Only one of the boards can provide data service, however, so you're still limited to 128 Kbps.

Installation is simple, at least for an ISDN product; I was up and running in about ten minutes. A quick-start card walks you through the process of installing the board, connecting the cables, loading the software, and configuring the board for your ISDN line and Internet service provider (ISP). The installer loads Big Island's YoYoLand 2.1 software, which handles voice calls, and Internet connection software tailored to your ISP.

Some of the nice touches in the interactive installer include a pop-up list of phone-company numbers for ordering ISDN, preconfigured settings for specific ISDN-capable ISPs, and installers for both Apple networking software and Microsoft's Internet Explorer 3.0. A PDF-formatted electronic manual offers details

on installation, including a clear, concise guide to ordering an ISDN line compatible with the YoYo Pro.

Talk While You Surf

When you reboot, your Mac becomes a lean, mean telecommuting machine. If the Mac supports Apple's Control Strip, a YoYo Pro item in the strip displays the



The Handoff YoYo Pro supports advanced ISDN call-management features, such as hold, three-way calling, and call transfer.

board's data-connection status, including connection speed and throughput. When you launch any Internet application, the YoYo dials up a 64-Kbps data channel to your ISP in just a second or two, giving you the sense of a dedicated Internet connection. Alternatively, you can dial up a second data channel to get 128-Kbps throughput. And unlike external ISDN terminal adapters that connect through the performance-robbing Mac serial port, limiting them to about 100 Kbps, the YoYo Pro delivers a full 128 Kbps.

The YoYo Pro's Internet capabilities also integrate well with its voice features. For example, if you're online with both data channels and pick up your phone to make an outgoing call, the YoYo cuts the data bandwidth back to 64 Kbps; when you finish the call, data traffic resumes at 128 Kbps. If you pick up one line to make an outgoing call while the YoYo is using that line for your Internet connection, the device automatically switches to the other line for your outgoing call.

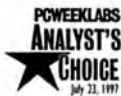
All the call-management features of YoYo 1.2 are here as well: the phone book, hot-key dialing, inbound call logging, sound and voice call announcing, call filtering by incoming number and time of day, and call notification by alpha pager or e-mail. The Pro version adds logging for outbound calls, call forwarding, distinctive ringing, and a host of handy interface improvements. One major interface change supports multiple phone lines: in the lower corner of the YoYo's floating window is a color-coded triangle with a number indicating the analog line being controlled; by clicking on the triangle, you switch from one line to another. The floating window also displays buttons for more advanced voice features—hold; conference; and transfer, which lets you re-route a call to any phone in the world (see "The Handoff").

Although it's easy to use, the YoYo Pro has a few minor annoyances. First, the Internet connection doesn't support dynamic bandwidth allocation, which would automatically increase bandwidth from 64 Kbps to 128 Kbps when you need it for large data transfers. Second, even if you have two or more YoYo Pro boards installed, YoYoLand's Internet dialer limits you to a connection speed of 128 Kbps. Third, when you're connected to the Internet at 128 Kbps, an incoming call doesn't automatically release half the bandwidth (one voice channel) to let you answer the call. And finally, although the Control Strip displays your ISDN data-connection speed, the YoYo Pro can't display the current state of analog phone ports. Big Island says the next version of YoYoLand will fix these shortcomings.

Macworld's Buying Advice

Until now, you had to buy two ISDN lines and two ISDN hardware devices to get fully functional voice and data for telecommuting. The YoYo Pro integrates these two disparate worlds very nicely, making it an ideal way to give your small office a big-office presence.—MEL BECKMAN

RATING: ★★★★½ **PROS:** Elegant voice and data integration; easy configuration; full-speed ISDN data throughput; a Mac can have multiple boards. **CONS:** Doesn't display information on analog line state; no dynamic bandwidth capability. **COMPANY:** Big Island Communications (415/237-0350, www.big-island.com). **LIST PRICE:** \$399.



"Retrospect. It's great. Buy it."
MacUser, October, 1997

RETROSPECT TURNS THE BIG 4.0!



Everybody's favorite backup software has hit 4.0. And a true milestone it is!

Retrospect 4.0 backs up data at twice the speed.

Retrospect 4.0 is seasoned with enough real-life

experience to perform like no other backup program.

Compared to version 3.0, it does more, it looks better, and it has big time performance improvements.

If you're a network administrator, new TCP/IP support means you'll back up twice as many computers in the same amount of time.

And we're talking huge volumes—up to a



Retrospect is totally compatible with the new Mac OS 8, so upgrading won't put you behind the eight-ball.

full terabyte—and millions of files. Installation is a breeze—4.0 can update every client on the net and you won't have to change a single script.

Everyone wants a smooth upgrade to Mac OS 8 and Retrospect is extraordinarily compatible with both

Systems 7 and 8. Public service announcement: Make sure to back

up before you make the move!

Speaking of smooth, now you can get backup

status by email or pager. You, too, can

have your beeper go off at a dinner party just like the doctor next to you.

There's more. Now you can save a browser to a file, or export a catalog to a database. We've included a whole slew of custom drivers to assure compatibility with almost any drive you could name from tape to MO to CD-R. There's even an automatic reminder to clean the tape heads.



Celebrate Retrospect's big 4.0 with us—call 1-800-982-9981 and treat yourself to a high-speed upgrade.



For Zip, Jaz, SyQuest, MO, or any removable drive, new 4.0 is the perfect team player.



Retrospect's interface received recognition from Apple for Human Interface Design Excellence.



Our exclusive SnapShot™ technology now lets you recover any previous backup session, not just the latest, so you can restore your hard disk exactly the way it was at any point in time.



To go forward, you must backup.®

Circle 26 on reader service card

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Freeway

UNDERPOWERED QUARKXPRESS CLONE FOR THE WEB

FOR GRAPHIC DESIGNERS LOOKING to make a smooth transition to the Web, SoftPress Systems' Freeway 1.0 may be the answer. This new Web-page editor imitates QuarkXPress's interface, letting QuarkXPress users create Web pages with almost no learning curve. Yet Freeway's slavish adherence to QuarkXPress, which was designed for creating static print pages, leaves the application at a near standstill when it comes to the Web's dynamic content.

Zero to Sixty in No Time

Experienced desktop publishers should feel right at home in Freeway and be able to create a Web page in just minutes.



Déjà Vu Freeway's interface similarities to QuarkXPress hold true right down to the \mathbb{H} -key assignments. One difference is a hyperlink pop-up that allows you to link objects to other Freeway pages or to external URLs.

After specifying the page size, you can create master pages containing elements that are shared across pages. Margin and ruler guides also have a familiar desktop-publishing feel, as do the horizontal and vertical grids and rulers.

As in XPress, you draw boxes that act as containers for text, graphics, and multimedia; the boxes can snap to guides or grids, so you can align the page elements easily. The HTML Rectangle tool lets you create boxes to hold normal body text, which you import either by opening the text file with the Import command or by dragging and dropping it onto the Freeway document from the Finder or another application. Other tools let you link and unlink long text flows from one

text box to another, and Inspector palettes give you fine control over page, text, and graphic elements. Even the key commands in Freeway are familiar, imitating those in QuarkXPress and Adobe Illustrator (see "Déjà Vu").

One of Freeway's most appealing features is the way it converts styled text to GIFs. All you do is drag out a GIF rectangle; choose any font, style, and size; and type away. The text stays editable in Freeway. When you publish the page, Freeway automatically converts the text into a GIF that's nicely antialiased against the page's background color. This is an important feature, because it frees Web authors from the drudgery of preparing headlines and other text in Adobe Photoshop.

Freeway also converts EPS, PICT, and TIFF files into GIF or JPEG format, depending on the complexity of the original file. And although you can't overlap graphic elements in HTML, it's no problem in Freeway; the program groups the different images into one composite image when you publish the site.

Bumps and Potholes

Considering both Freeway's price and its billing as a professional tool, the list of things it *doesn't* do, or does poorly, is much longer than it should be. Incredibly, Freeway doesn't support tables. There's no way to create HTML frame sets in Freeway, and you can't use text as an anchor; only an image can be an anchor, and the image must also be a link. You can't wrap text around an image, and you can't edit the HTML Freeway generates.

Another negative is the program's almost nonexistent site-management tools. By default, Freeway publishes all the files in a site to a single folder rather than segregating them into separate image and HTML folders (as GoLive CyberStudio and NetObjects Fusion do). Freeway uses the concept of folders differently—to group all the elements of one or more pages, as you might group chapters or sections in a print publication.

As other programs—including CyberStudio and Macromedia's upcoming Dreamweaver—rush to embrace dynamic Web sites, Freeway can't deal with Cas-

cading Style Sheets, and JavaScript requires a workaround via a cumbersome dialog box. Multimedia elements—such as animated GIFs, sounds, and QuickTime movies—must be previewed in a browser to display correctly. And when using Freeway to create a site, you have to start from scratch; there's no way to import existing HTML pages, much less entire sites, into Freeway.

But Freeway's biggest problem is its premise: it's based on the flawed idea that tools that work well for desktop publishing are automatically appropriate for Web design. Trouble is, Web pages are fundamentally different from print pages; they don't have fixed sizes, and they can look entirely different depending on the browser or platform. Freeway and, to be fair, tools such as Fusion and CyberStudio give designers the illusion that they have a degree of control over page layout and display that's impossible in the real world. No matter what tricks Freeway uses to place text and graphics, a WebTV user is going to have a wildly different experience from one using Netscape Navigator, and there's nothing the designer—or Freeway—can do about it.

At the moment, sales and support for Freeway are available only via the Web and e-mail. The manual is included on the CD-ROM in HTML and PDF formats; the only printed documentation is a brief Getting Started booklet.

Macworld's Buying Advice

Freeway is a good tool for prototyping Web pages, especially for designers who are new to the medium. You can create good-looking pages with a minimum of training, and it makes short work out of many Web-page-production tasks that would otherwise require multiple programs. Unfortunately, Freeway's drawbacks are significant; the program lacks common features that its competitors have had for some time. Freeway has promise, but for now it's stuck in second gear.—TOM NEGRINO

RATING: $\frac{3}{5}$ **PROS:** Easy transition for QuarkXPress users; creates antialiased GIFs from styled text. **CONS:** Can't import existing HTML pages; no frame or table support; limited JavaScript support; no access to underlying HTML. **COMPANY:** SoftPress Systems (415/331-4820, www.softpress.com). **LIST PRICE:** \$299.



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Speed Doubler 8

MAC OS 8-COMPATIBLE UPGRADE ADDS NEW OPTIONS, KEYBOARD FEATURES

IF COMPATIBILITY PROBLEMS FORCED you to part with Connectix's Speed Doubler after updating to Mac OS 8, it's time to get reunited. Not only is Speed Doubler 8 Mac OS 8-compatible, but it also adds several completely new features to its arsenal. What hasn't changed is that the program's speed boost varies a great deal depending upon the task you're performing and the Mac you're using. In some cases, you'll see minimal benefit; in others, such as file transfers to and from a server, your speed may more than double (see "Speed Doubler 8 Almost Lives Up to Its Name").

Speed Doubler's original boost came primarily from an enhanced 680X0 emulator, which greatly accelerated non-PowerPC-native applications running on Power Macs. But now, with almost all current software running native code, the relative benefit of this core component has decreased dramatically.

Although Speed Doubler's second speed-enhancing component, Faster Disk Performance, works with *all* Macs to improve on Apple's disk cache, it works best on those Macs with enough extra RAM to allocate a large amount to the cache. Recent improvements in Apple's caching scheme and increases in the overall speed of hard drives have reduced the benefit of this feature.

As Connectix itself admits, the most noticeable gains will be seen with older PowerBooks and removable drives. In Macworld Lab tests, a 200MHz desktop Power Mac transferred files over a network at least 11 percent faster when both

Faster Emulation and Faster Disk Performance were enabled.

The benefits of Speed Doubler 8's third main component, Faster File Copying, depend on what you copy and how you copy it. As in previous tests, Speed Doubler actually lengthened copy times when copying a single, large, 20MB file and offered no benefit when copying a moderate number of files (an 11MB folder with 55 files). But when copying a large number of files—a 38MB folder with 876 files—Speed Doubler impressively cut copy time in half. Best of all, when copying files over a network, Speed Doubler's gains live up to the product's name—even when copying a small number of files. In some tests, copying was more than four times as fast with Speed Doubler enabled.

Productivity Boosts

Other Speed Doubler features enhance your overall productivity. If you recopy a folder with only a few files modified from the previous copy, the Finder replaces all the files; Speed Doubler's Smart Replace feature copies only those items that have actually changed. Like Apple's built-in File Assistant, Speed Doubler's Synchronize option places the latest version of all files from multiple drives onto each drive; Speed Doubler is faster, however, and it generates fewer error messages.

Speed Doubler 8's Copy Agents feature lets you create and save sets of files and folders to be copied, and it lets you schedule them to be copied automatically. Although not nearly as full-featured as

a dedicated backup utility (such as Dantz's Retrospect), this simple capability can serve many users' needs.

Speed Doubler 8 boasts two new keyboard features. Hot Keys lets you assign keyboard shortcuts for opening specific applications or pasting user-defined text into a document. Other programs—such as CE Software's QuicKeys and West-Code Software's One Click—offer similar (or superior) functionality, but Speed Doubler holds its own as a fine, low-end alternative. Keyboard Power lets you activate drop-down menus and select commands from them, entirely via the keyboard. Although this feature worked perfectly, I didn't find it particularly helpful for speeding up my work.

Macworld's Buying Advice

Speed Doubler *does* speed up your Mac, although typically not quite as much as its name implies—at least in general use. Still, anyone satisfied with the previous version of Speed Doubler should welcome this upgrade. With its new features, this latest version is beginning to move in the direction of a multipurpose utility akin to Now Utilities. As an attractively priced collection of easy-to-use conveniences and speed-enhancing features, Speed Doubler 8 definitely makes the grade.—TED LANDAU

For more information on Speed Doubler 8, please refer to www.macworld.com/more/.

RATING: ★★★ **PROS:** Simple to use; significantly improves copy times; valuable new keyboard features. **CONS:** Faster Emulation and Faster Disk Performance components provide only a small benefit on recent hardware. **COMPANY:** Connectix (415/571-5100; www.connectix.com). **LIST PRICE:** \$49.



Speed Doubler 8 Almost Lives Up to Its Name

Shorter bars are better. Times are in seconds.

	Transfer to External Drive	Transfer from External Drive	Transfer to Server	Transfer from Server	Microsoft Word Scroll	FileMaker Sort
Power Macintosh 7300/200	7.10	7.14	73.28	79.23	90.45	14.51
with Speed Doubler 8.0.1	8.50	9.08	23.64	18.61	69.35	11.85

Behind Our Tests

System was tested using Mac OS 8. File-transfer tests used a 20MB file. For detailed information on our test suite, see www.macworld.com/tests/.
—Macworld Lab testing supervised by Jeffy Millstead

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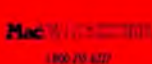
ATI NEXUS GA	316
IXMicro TwinTurbo 128MB	297
Matrox Millennium	254

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Ray Dream 3D

BARGAIN-PRICED 3-D WITH ROOM TO GROW

OFFERING MANY OF THE FEATURES of the higher-end Ray Dream Studio 5.0 (see *Reviews*, December 1997) without the high-end price, MetaCreations' Ray Dream 3D is a scaled-down package perfect for newcomers to the 3-D world. At a street price of less than \$100, Ray Dream 3D not only is a bargain, but it also offers enough depth and power to keep those users from outgrowing the program too quickly. (Just be aware that this version, unlike earlier versions, requires at least a PowerPC processor.)

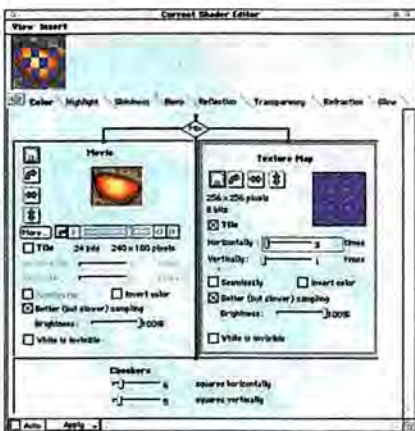
Easy Dreaming

Ray Dream 3D's automated modeling and scene wizards help neophytes create simple but attractive objects, scenes, logos, and other 3-D entities quickly. Artists and business users, in particular, will appreciate the wizards, which step you through the process of creating a customizable final scene containing the elements you specify. Ray Dream 3D's collection of more than 750 3-D models, 400 textures, and dozens of sample scene-setup files also helps new users get started quickly.

Once you move beyond the basics, you'll begin to appreciate the program's depth. The extrusion, lathing, sweeping, and lofting tools will be familiar to artists used to popular illustration programs such as Adobe Illustrator and Macromedia FreeHand, offering a good deal of control over the process of creating and modifying shapes in 3-D space. As you create and edit a shape, 2-D projections of it appear on x, y, and z reference planes.

Ray Dream 3D makes it easy to convert TrueType and PostScript fonts into extruded 3-D type and gives you excellent control over beveled edges. Not surprisingly, the program lacks the higher-end features—vertex-level editing, Booleans, mesh editing, and shape deformation—found in Ray Dream Studio. These omissions are somewhat balanced by the fact that Ray Dream 3D gives you almost overwhelming numerical control over every scene parameter, allowing exact placement of objects on scenes and precision alignment (a feature sometimes missing from higher-end 3-D packages).

One of Ray Dream 3D's most impressive features involves texture generation: it lets you combine several types of surfaces using an extremely powerful, flow-chart-style interface. For example, you can create a checkerboard pattern with marble- or stone-textured checks. Along with basic procedural textures—such as spots, marble, and wood—Ray Dream 3D



Deep Textures Even though Ray Dream 3D takes aim at the consumer end of the market, its Shader Editor is stronger than what you'd find in many pricier packages. Here, a QuickTime movie and a still image create a checkerboard pattern that can be applied to an object as a single texture.

offers a library of presets, including metal and glass. Built-in 3-D painting tools let you brush textures onto object surfaces; unfortunately, their performance is glacially slow. Serious texture painting still requires a separate application, such as MetaCreations' Detailer (see *Reviews*, February 1997).

Animation and Rendering

The animation controls, while no match for those in high-end animation programs such as MetaCreations' Infini-D 4.0 and Ray Dream Studio, are actually quite good for most basic (and even some advanced) tasks. The timeline interface is both straightforward enough for first-time animators and robust enough for experienced digital-movie makers. Besides the expected capabilities for object scaling, positioning, and rotation interpolation are some pleasant surprises: you can

animate the spline controls of complex free-form shapes (to create a waving flag, for example) and combine QuickTime movies with light sources to create animated lighting effects; the texture movie appears to be projected onto the scene from the light source.

The animation timeline offers basic velocity graph controls, along with object-oriented style behaviors that you can drag and drop onto objects; those behaviors let the objects spin, bounce, and follow or face a specific object in the scene. Absent are inverse kinematics and motion constraints (crucial for character animation), particle systems, field rendering, and other high-end animation features. However, these omissions don't detract from Ray Dream 3D's usefulness as a tool for creating basic animated logos and more-advanced visualizations.

Ray Dream 3D's rendering quality is adequate and its performance above average. The program's ray tracer is a decent renderer, and you can render directly to GIF, Photoshop, RIFF, and VRML formats. The package also includes ThinkFish Productions' NaturalMedia renderer, which automatically creates natural-looking rendered effects such as sketch, pencil, and silk screen. And you can render multiple files in batches, a crucial feature for unattended rendering.

Perhaps the program's biggest drawback is its instability; it crashed in a variety of reproducible and nonreproducible ways. (MetaCreations is working on a bug fix that should be available by the time you read this.)

Macworld's Buying Advice

For the money, Ray Dream 3D is the best bargain in town. Given the balanced complement of modeling, rendering, and animation tools, it simply has no competition in this price range. While the program probably won't lure advanced 3-D artists away from higher-end options, consumers will welcome this simple, inexpensive way to get their feet wet in the world of 3-D.—DAVID BIEDNY

RATING: ★★★ **PROS:** Good performance for the price; good basic animation tools, spline modeling tools; powerful texture handling. **CONS:** Buggy; requires at least a PowerPC processor. **COMPANY:** MetaCreations (408/430-4000, www.metacreations.com). **LIST PRICE:** \$149.

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PL-300 LCD Tablet

DIGITAL CANVAS MERGES AN LCD SCREEN WITH A DRAWING TABLET

THE COMPUTER IS A TERRIFIC artists' tool, but it lacks immediacy; you drag a mouse or stylus across a horizontal surface and watch for a response a foot or more away on a vertical screen. Sketching, tracing, and even signing your name take months of practice, and even then, the results are never quite as successful as when drawing with a pencil on paper.



ARNOLD THORIO

Bridging the feedback gap, Wacom's PL-300 combines an LCD monitor and a pressure-sensitive tablet into a single device that lets you paint directly onto the screen. You press on the display, and the pixels change color. In short, it's a computerized canvas.

Because the cross-platform PL-300 is really two devices in one, it plugs into both the monitor port and the serial port. The 8-by-6-inch LCD performs best at the PC-standard resolution of 800 by 600 pixels. This 18-bit active-matrix screen can display 262,000 colors—that's eight times what a 16-bit screen can display. The PL-300's controls let you center the image on the screen and adjust the focus, although I noticed slight but consistent problems with softly focused pixels running in vertical bands. The biggest hitch is that you have to set the screen refresh rate to 56Hz or 60Hz; if you select a higher rate (as the Mac OS automatically does), it's impossible to synchronize the stylus with the screen.

An adjustable stand lets you use the tablet upright like an easel or slightly inclined like a drawing table. Both positions lock in place, so you can draw without the screen slipping. A single six-foot

cable extends from the tablet to the CPU, allowing you to move the tablet onto your lap without fussing with a lot of cords.

Setting up the PL-300 is an effort. If you currently own a Wacom tablet, you may have to delete the Preferences file before installing the new software. As part of the setup process, you calibrate the stylus with the LCD so that the pen nib and the cursor move in perfect unison. Once this is done, the tablet does what it promises—it tracks the behavior of the stylus at 508 lines per inch, roughly five times the resolution of the display. When I painted in Adobe Photoshop and MetaCreations' Painter, the cursor sometimes lagged behind the stylus, although it always caught up to produce smooth, evenly curving lines. And you shouldn't mistake the PL-300 for a color-accurate device; most artists will prefer to run the PL-300 as a second monitor off an independent video board.

Because my evaluation of the PL-300 is based on only a few days of experience with the tablet, it's difficult to determine how the screen holds up to frequent and repeated pressure. Although the PL-300 includes a protective plastic shell, it's possible to bend the screen and pucker the LCD under normal use. My advice is to use the tablet as much as possible during the first year, while it's still under warranty, and keep an eye out for dead pixels (those that fail to light in one or more color channels).

Macworld's Buying Advice

Assuming you can handle the complexities of this new hardware—and you're wealthy enough to afford it—the PL-300 is likely to be the best drawing tablet you've ever used. The ability to draw on the screen and see the results at your fingertips is indescribably liberating. The quality of your brush strokes can't help but take a quantum leap.—DEKE McCLELLAND

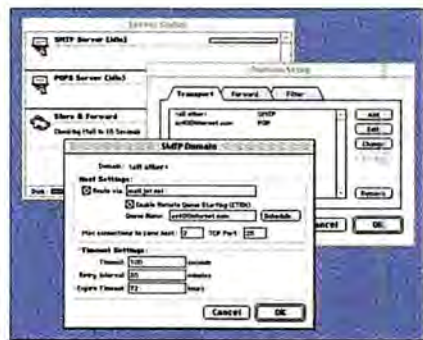
RATING: ♦♦♦♦ **PROS:** Lets you draw directly on the screen; flexible design; excellent tracking. **CONS:** Cumbersome installation; prohibitively expensive. **COMPANY:** Wacom Technology (360/750-8882, www.wacom.com). **LIST PRICE:** \$2,699.

QuickMail Office

EASY-TO-USE MAIL SERVER HAS SECURITY PROBLEMS

THROUGH RAIN, SLEET, SNOW, and dead of network, the e-mail must get through. If you're looking for an all-in-one Internet e-mail solution, CE Software's QuickMail Office 1.0 is just what the forecaster ordered. In addition to Macintosh server software, you get client software for both the Mac and Windows machines. Windows server software is also available, and you can buy the Mac server software sans client software if you plan to use Netscape Communicator or another ubiquitous e-mail client.

The package consists of a CD-ROM containing the software and PDF-formatted documentation, along with hard-copy manuals. A one-click installer gets the server going in just a few minutes. CE Software makes client installation ingeniously simple by letting you customize the installer for your organization; you can then copy the client installer to any Mac or PC using remote file sharing. Users answer a few simple questions, and they're on the air.



Full Service on or off the Net QuickMail's ETRN feature lets you operate a full-featured Internet mail server without a dedicated Internet connection.

The client application, QuickMail Pro 1.5, improves on version 1.0 (see *Reviews*, March 1997), with better performance; support for MIME-styled text, enhanced mail filtering, and compound searches; and built-in Finger, Ph, and LDAP directories.

But it's the server that makes this package shine. Besides simple setup, the server offers two powerful features that bring Internet e-mail serving to organizations that don't have a dedicated Internet

connection. Extended Turn (ETRN) lets your ISP act as a holding pond for incoming mail; the server drains it periodically when bringing up your Internet connection. If your ISP doesn't support ETRN, you can use the built-in POP3 bridge to retrieve all your company's mail from a single mailbox at your ISP and then automatically distribute that mail to users. The server also supports AppleScript message processing and includes scripts for handling vacation mail, autoresponding, and spam filtering; it even supports the rapidly disappearing UUCP protocol.

Although the server does everything it promises, there are a few icy spots in the road. It requires a PowerPC, so you can't press that dusty old Centris into e-mail service. The server also has weak remote-administration capabilities: you can send it special e-mail messages to reprogram the autoresponder, spam, and vacation scripts, but that's about it.

Testing also uncovered two serious security problems. First, the ability to reprogram filters remotely via e-mail requires no authentication. That means anyone on the Internet can wreak havoc with your network by announcing that your boss is on vacation, filtering important incoming mail, and taking over your autoresponder. Second, anyone on the Internet can use your server as a relay station for passing junk mail to other networks. If you don't have a dedicated Internet connection, the relay hole isn't a problem—but dedicated users, beware.

CE Software developed a fix for the first problem as soon as we reported it; an update plugging the second security hole should be available by the end of 1997.

Macworld's Buying Advice

As an easy-to-use e-mail bundle for non-dedicated Internet connections, Quick-Mail Office is a great solution: it offers simple client setup and powerful off-the-Net server capabilities. Just make sure you install the security fix before it goes on the Internet full-time.—MEL BECKMAN

RATING: ★★★ **PROS:** ETRN for nondedicated server connections; POP3 bridge; list server; client-setup wizard. **CONS:** Weak remote administration and security; spam-relay block missing; requires PowerPC. **COMPANY:** CE Software (515/221-1801, www.cesoft.com). **LIST PRICE:** Five users, \$380; 25 users, \$1,200; 100 users, \$4,000.

Zip Plus

MORE BANG FOR MORE BUCKS

IN A RECENT ROUNDUP OF REMOVABLE-storage drives, I characterized Iomega's Zip drive as "glacially slow but exceptionally cheap" (see "Storage to Go," August 1997). With the Zip Plus, Iomega adds a faster, pricier model to its low-end removable roster. Although its few but much needed improvements are not likely to persuade current Zip owners to scrap their existing drives, the Zip Plus is a good buy for those in the market for cheap removable storage.

Externally, not much differentiates the Zip Plus from the original Zip (which



MICHAEL FALCONER

is still available for \$150) other than a smaller, lighter power supply—and-plug combo. The power supply now works with any standard line voltage, but the plug is still so wide that it partially covers neighboring outlets on most power strips. A new cable can connect the drive to a Mac or PC SCSI connector or to a PC parallel port, and the drive automatically configures the correct connection, making the Zip Plus exceptionally versatile.

Like the original Zip, the Zip Plus inconveniently allows one of only two dif-

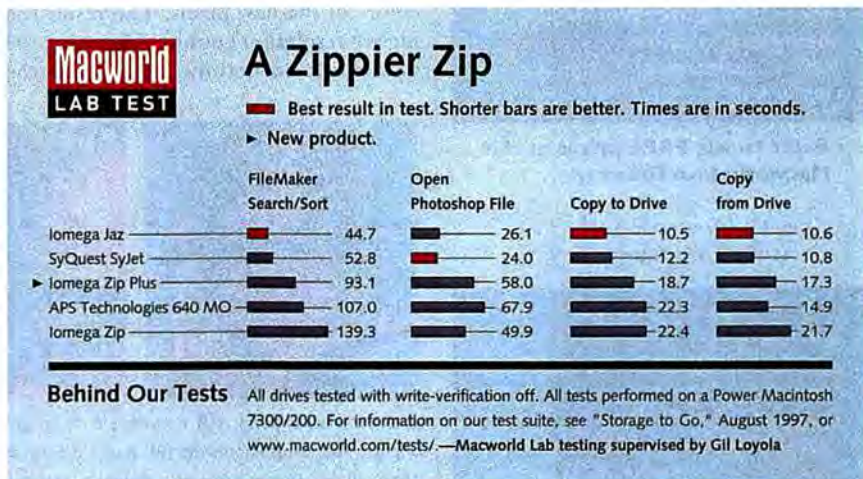
ferent SCSI ID numbers, but SCSI termination is now automatic. And where the original Zip had no power switch, the Zip Plus's eject button doubles as an on/off switch when the drive is empty. Interestingly, you can turn the Zip Plus off even if your Mac is running—the drive maintains enough power for proper data transfer on a SCSI chain. Inserting a disk automatically turns the drive back on.

Although the Zip Plus uses standard 94MB Zip disks, it shaves about 28 percent off its predecessor's wait time. In relation to the drives we tested last August, the Zip Plus moves into the same performance league as the APS 640 MO drive—about half the speed of the Iomega Jaz, the fastest drive we tested. The Zip Plus's manual is a considerable improvement over the Zip's minimalist folding instruction sheet, and the drive comes with two CD-ROMs of software.

Macworld's Buying Advice

Where the Zip drive is glacially slow, the Zip Plus is merely plodding. I wouldn't recommend that current Zip owners throw out their old drive and buy a Zip Plus. It's still no match for a Jaz drive; at twice the price, the Jaz gives you double the speed and ten times the capacity. But if you're shopping for ultracheap removable storage, then the Zip Plus is a good choice.—ROBERT C. ECKHARDT

RATING: ★★★½ **PROS:** Faster than a Zip drive; on/off button; lots of bundled software; uses standard Zip cartridges. **CONS:** Still pretty slow; power plug still too big. **COMPANY:** Iomega (801/778-1000, www.iomega.com). **LIST PRICE:** \$199.95.



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Genuine Fractals

PLUG-IN DELIVERS PIXEL-FREE FORMAT

WOULDNT IT BE GREAT IF Adobe Photoshop saved to a scalable format, so you could ignore technical issues such as resolution and concentrate exclusively on the art? This is precisely the promise of Genuine Fractals.

Over the years, numerous vendors have claimed to have revolutionized image editing with the creation of pixel-free image formats. But for all their relative merits, Kodak's Photo CD, Macro-media xRes's LRG, and Live Picture's IVUE and FlashPix are positively infested with pixels. Now Altamira Group stakes its own claim with Genuine Fractals, a plug-in for Photoshop that purports to throw away every last pixel and replace it with fractal descriptions of edge contours and color blocks. The good news is that this time, the claim is true.

Genuine Fractals makes use of a pixel-free imaging scheme called Fractal Image Format (FIF), which lets you enlarge images without interpolating pixels or blurring details. Using the export module, you can save an RGB image to a compressed FIF file that consumes about 10 to 15 percent of the image's original size on disk; a 20MB image shrinks down to 2MB to 3MB, small enough to upload to a BBS or e-mail. Your client or printshop uses the Genuine Fractals import module to open the image at virtually any pixel dimensions.

Scaling fractals is a different prospect from scaling pixels. When you enlarge an image in Photoshop, the program averages neighboring pixels to calculate the colors of the new pixels. The result is a higher-resolution but blurrier image; the new pixels do nothing to improve the

actual quality of the image. Scaling fractals is more analogous to scanning a piece of film at a higher resolution. Genuine Fractals generates new pixels that follow mathematical edge definitions, thus maintaining sharp focus regardless of scale (see "Pixel-Free Resampling").

This isn't to say that the compression-and-expansion process is lossless. Like JPEG, FIF modifies the details in your image. If you look closely, you can see JPEG-like color patterns and blocky edges, and if you scale an image beyond 300 percent or so, you'll encounter stair-stepping along high-contrast curves. But as with JPEG, the compression rarely shows in the printed output.

Genuine Fractals isn't a miracle. It can't make up detail out of thin air, so you still need to start with relatively high-resolution scans. It takes several minutes to export a large image as a FIF file, and the scaling operation has to occur entirely in RAM—Genuine Fractals can't exploit Photoshop's virtual-memory functions. Finally, FIF doesn't support CMYK, limiting the usefulness of the plug-in among artists who want to control the separation process.

Macworld's Buying Advice

Although it's not miraculous, Genuine Fractals is incredibly useful. If you occasionally work with very large images and have considered Live Picture or a similar program, Genuine Fractals is the plug-in you've been waiting for.—DEKE MCCLELLAND

RATING: ★★★★★
PROS: Provides pixel-free images; lets you scale images with little detail degradation. **CONS:** Doesn't support CMYK; lacks image previews; scaling limited by RAM. **COMPANY:** Altamira Group (818/556-6099, www.altamira-group.com). **LIST PRICE:** \$129.



Pixel-Free Resampling After saving a base image as a FIF file (A), I enlarged the image to three times its original size, using Photoshop (B); then I did the same by using the Genuine Fractals import function (C). Although the difference is subtle, Genuine Fractals produces a sharper image with crisper edges.

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Circle 201 on reader service card

Web-Searching Utilities

WEB ARCHER AND WEBFIND ASSISTANT SPEED INTERNET SEARCHING

FINDING WHAT YOU NEED ON the Web can be a nightmare, in spite of—or perhaps because of—the plethora of search engines, each with its own peculiar way of searching. Two new utilities take the approach of offering a single interface for searching multiple information sources, with mixed results. Crush Software's WebFind Assistant 1.0.2 gives you a front end for nine of the leading engines but suffers from a clumsy user interface; ClearWay Technologies' Web Archer 1.0.1 chooses data sources for you from an internal list of Internet resources, but you often have to perform multiple searches to find what you're looking for.



Pop-up Searching This pop-up menu gives you access to Web Archer's searchmarks, information categories that go beyond traditional search engines'.

WebFind Assistant displays a floating window with a pop-up menu and a search field. From the menu, you choose one of nine popular search engines; type in what you're looking for; and then click on the Search button. WebFind sends a message containing the formatted search command to your browser, which displays the result. If you choose an engine that lets you specify a maximum number of results, you set that number through another pop-up menu.

Although WebFind Assistant works very well with all the search engines it supports, it would be nice to be able to add engines to that list or use the program to search specialized engines. A bigger annoyance is the WebFind window: because it's wide and floats in front of the browser window, it always seems to be in the way. There's no way to minimize the window, even though its title bar has a window-shade interface widget.

By comparison, Web Archer doesn't compete for your attention or overstay its welcome. When you launch the program, it puts an icon in the corner of the screen; clicking on it expands the Web Archer window, which contains a pop-up menu for information categories (called *searchmarks*), a small text field, and a Go button. Web Archer uses your text-field entry and the searchmark you choose to figure out what information source to use. If you choose the News/Stocks searchmark and type in AAPL, the stock-ticker symbol for Apple, it gets a stock quote; if you enter Apple, it looks for a news story about the company. Each searchmark uses several sources, and repeating a search by again clicking on the Go button moves Web Archer to the next source in the internal list. Frustratingly, you can't specify which source it should use first or add your own sources. And although searchmarks are a useful idea, they could be a bit smarter; the air-bill-tracking searchmark can't search UPS, for example, and the stock quotes don't understand ticker symbols for mutual funds.

Macworld's Buying Advice

Both Web Archer and WebFind Assistant are useful, low-cost additions to a Web-browsing tool kit, but if I had to pick just one, I'd go with Web Archer; it finds a wider variety of information, and its ability to divine what you're looking for is surprisingly useful.—TOM NEGRINO

Web Archer 1.0.1

RATING: $\frac{4}{5}$ **PROS:** Clean, unobtrusive interface; always available; not limited to standard search engines. **CONS:** Multiple searches often required; searches can't be customized. **COMPANY:** ClearWay Technologies (617/262-4006, www.clearway.com). **LIST PRICE:** \$29.95.

WebFind Assistant 1.0.2

RATING: $\frac{3}{5}$ **PROS:** Understands search syntax for the top search engines. **CONS:** Intrusive floating window; search engines can't be customized. **COMPANY:** Crush Software (718/263-0313, www.crushware.com). **LIST PRICE:** \$20.

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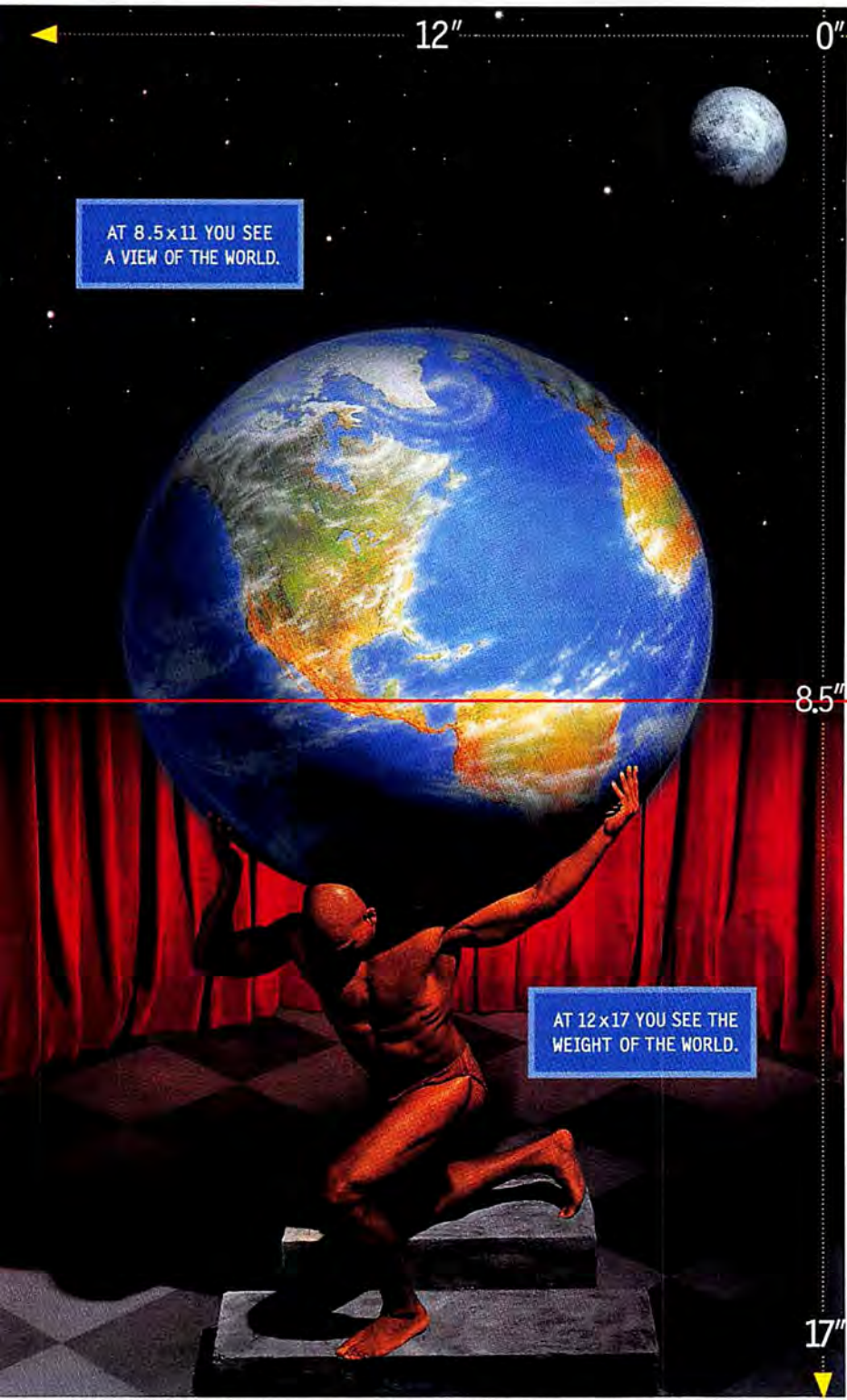


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Spring Cleaning 2.0

HARD-DISK CLEANUP IS HARD WORK

LIKE WITH TODAY'S BLOATED software leaves our hard disks strewn with unnecessary preference files, help files, empty folders, aliases, and duplicates. Aladdin's Spring Cleaning 2.0 is designed to sweep up such megabyte-robbing detritus; unfortunately, it needs a little cleaning up of its own. Thanks to an unhelpful manual and the need for the user to recognize what's trashable, what could have been an excellent general-interest tool seems better suited to experts.

After launching the program, you can click on buttons to find broken aliases, duplicate files, empty folders, wayward fonts, help files, entire programs and associated support files, orphaned documents, and orphaned preference files. There's also a useful option to slim down "fat binary" programs such as Adobe Photoshop, trimming an application by up to 33 percent.

Unfortunately, Spring Cleaning's non-standard interface is confusing. For example, nothing happens when you click on a search button; you must restate your intention by clicking on an OK button. After choosing a hard disk to search (and again



Help Less Spring Cleaning gives you a hand in deleting help files for programs you already know by heart.

clicking on an OK button), you're interrupted by a message asking if you *want* to perform the search you've specified. (Would you have come this far if you *didn't*?)

At last the search begins—in some cases, agonizingly slowly. The duplicate-finding feature, for example, took more than 30 minutes to search a 2GB hard disk. When Spring Cleaning shows you the resulting list of files, you can highlight them and choose an action from a menu—Move to Storage Folder, Move to Trash, and so on—yet nothing happens until you click on a Do Action button to execute your menu selection and then click on OK in yet *another* confirmation box. (Fortunately, a preference lets you

turn off some of these extra confirmations.)

Be careful with the search-results list: if you use the Uninstall command, for example, to remove Photoshop and its related files, Spring Cleaning cheerfully lists all your Photoshop *documents* among them. And the program is not helped much by its appalling manual—70 pages of wooden tech-speak, explanation-free tutorials, unnecessary apostrophes, and blatant copy-and-paste jobs.

Macworld's Buying Advice Make no mistake: when it doesn't crash with a Type 3 error, Spring Cleaning does indeed help you clean up your hard disk. Within two hours, I'd deleted 45MB of useless junk from my 2GB disk. But Spring Cleaning's poorly designed interface, unhelpful manual, and redundant confirmation boxes mean you have to *work* for those reclaimed megs. Since many of the program's features are available in more-stable, less expensive shareware (such as Yank and PowerPCheck), Spring Cleaning's cost is just too high.—DAVID POGUE

RATING: \$\$\$½ **PROS:** Great concept; can skim off dozens of megabytes of useless files. **CONS:** Slow; buggy; confusing interface and manual. **COMPANY:** Aladdin Systems (408/761-6200, www.aladdinsys.com). **LIST PRICE:** \$120.

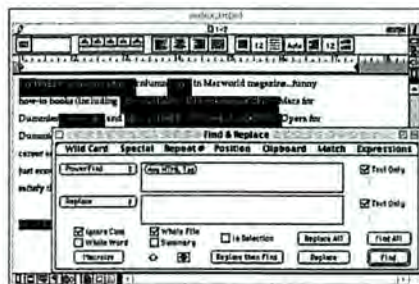
Nisus Writer 5.1.1

RENEGADE WORD PROCESSOR MATURES

IN THE WORD-PROCESSOR RACE, Nisus Writer has always been the write-in candidate. Requiring about half the RAM necessary to use Microsoft Word 6, Nisus sports a feature list that's as long as—but very different from—that of its ubiquitous competitor. Version 5.1.1 offers a plethora of tiny improvements—90 in all—that the program's small but devoted following will welcome. On the other hand, a few important big-ticket items are still missing, even after all these years.

You could spend months with Nisus Writer and still discover delightful features with every new document. As outlined in our last look at the product (see *Reviews*, April 1997), Nisus Writer offers multiple everything (such as undos, clipboards, and language kits), noncontiguous text selections, two macro languages, a powerful Find/Replace feature that works on multiple open or closed documents, a beautifully implemented graphics layer, and so on. Yet despite its wealth of features, Nisus Writer feels as responsive as bare-bones applications such as SimpleText.

Version 5.1.1's enhancements are most-



HTML Processing Nisus Writer's unusual feature list can be put to some unusual uses. Here, the Find command has located all HTML code.

ly tiny. For example, windows and menus match Mac OS 8's new gray-scale look and feel. If your inner artist prefers to type on mauve or cinnamon instead of white, you can now select a custom background color. (Even more useful, this color selection is preserved if you export your document as a Web page.) Unlike Word, Nisus Writer now offers live scrolling: the page moves as you drag the scroll bar's thumb.

As in previous versions, pressing the option key makes the names on your Font menu appear in their actual typefaces; the new version eliminates the sluggishness of this feature's response. If you've set up a particularly useful Find/Replace request, you can save the operation as a macro. And

the company finally dares to print its phone number in the single, updated manual.

When Apple abandoned its component technology, the Nisus programmers lost valuable time that could have been used to address long-term weaknesses. In version 5.1.1, there's still no integrated outliner, grammar checker, or zoom functions, and tables still can't be split across a page break. Nisus Writer smoothly imports and exports Word and WordPerfect files, but you still lose style sheets in the translation.

Macworld's Buying Advice It would have been nice if Nisus Writer 5.1.1 included at least one major feature addition, such as outlining. Still, it's hard to disagree with the company's Claris-esque upgrade approach, in which dozens of everyday features are quietly polished; the result is an even more likable alternative word processor whose admirable speed, low horsepower requirements, and long feature list are left solidly intact.—DAVID POGUE

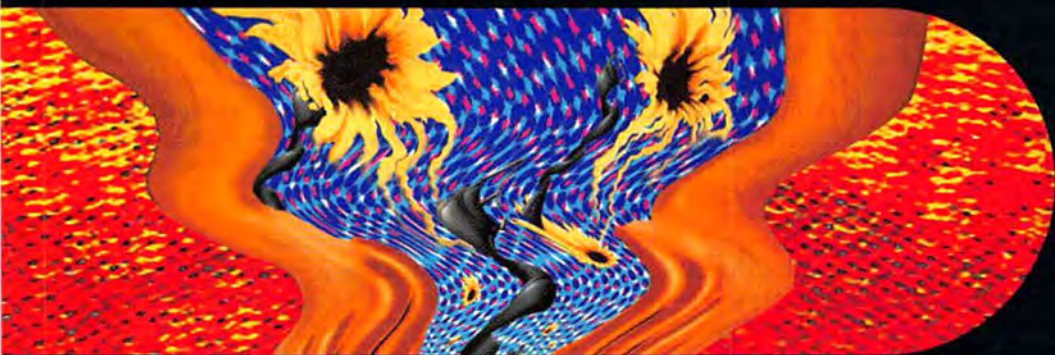
RATING: \$\$\$½ **PROS:** Vast feature list; multiple undos, clipboards, languages, and selections; many useful tweaks; low RAM requirement. **CONS:** No outliner, zoom commands, or multiple-column flexibility. **COMPANY:** Nisus (619/481-1477, www.nisus.com). **LIST PRICE:** \$249.



FreeHand™ 7.

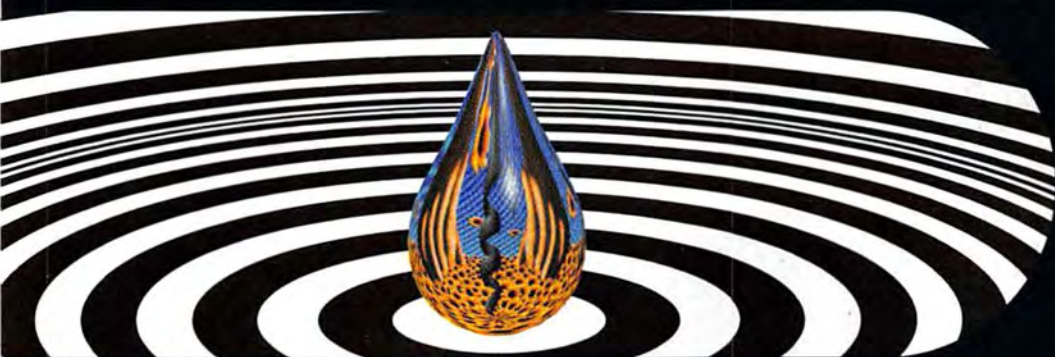
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Square One 4.0

IMPROVED PUSH-BUTTON LAUNCHING

A FEW YEARS AGO, FILE-LAUNCHING utilities were crucial system add-ons, providing easier access to frequently used programs, files, and folders. But that was before Mac OS 8's button views, contextual menus, spring-loaded folders and pop-up windows—not to mention the Launcher control panel. As navigational shortcuts have improved, the value of third-party file launchers has dropped considerably.

That said, Square One is still a worthwhile addition to your system. Although not as dramatic an enhancement as it was in the days of System 7, the program provides a simple, efficient way to organize your files into Launcher-like palettes of buttons. Version 4 offers much greater control over the look and behavior of your palettes.

Like previous versions, Square One 4.0 lets you create multiple palettes, each with buttons corresponding to specific folders and files on your hard disk. You can add files to a palette through a dialog box or simply by dragging them onto the palette, and you can create paged palettes with multiple panels that you navigate by clicking on tabs.



Buttons with Style Square One supports several different button styles, including the small flat icons shown in the top palette and the full-sized 3-D-style buttons in the lower palette on the right.

Instead of having to create several different palettes for various categories of files, you can create one unified palette with files logically divided into different pages.

New customization features let you change not only the color but also the style of each button palette. You can choose among four different button styles: standard, flat, outlined, and chiseled. You also have the option of hiding the scroll bar and status bar on each palette. Unfortunately, you're limited to only one style per palette; you can't choose a different button style, color, or icon size for each page.

You can add URLs to create direct links to your favorite Web sites, and you can make QuickKeys and KeyQuencer macros into buttons, too. Folder buttons in Square

One are now spring-loaded; if you drag a file to a folder button, a hierarchical menu pops up, letting you move the file directly to a subfolder. An improved Get Info command shows a file's type and creator codes in addition to the usual file information.

Square One is an application, not a system extension, so you must keep the program running to have its palettes accessible—sacrificing at least 500K of RAM. Of course, you can quit Square One and relaunch it each time you want to use it—a far less convenient and less useful approach.

Macworld's Buying Advice Square One is an inexpensive, well-designed utility that puts frequently used files a click away. The program's new features are compelling enough to make it a worthwhile system addition if you like working with a push-button interface, especially if you're not running Mac OS 8.—JOSEPH SCHORR

RATING: ★★★½ **PROS:** Button palettes with multiple pages; customizable button styles and colors; strong drag-and-drop support. **CONS:** Limited to one color, icon size, and button style per palette; similar features built into Mac OS 8; full-time use of 500K of RAM. **COMPANY:** Binary Software (310/449-1481, www.binarysoft.com). **LIST PRICE:** \$39.95.

Pantone Personal Color Calibrator

CALIBRATES YOUR MONITOR, DOES NOTHING FOR THE WEB

A PPLE'S COLORSYNC SYSTEM extension helps transfer the colors you see on your screen to the printed page: you select a predefined profile that matches your monitor, and then ColorSync communicates with your printer to maintain consistent color. Problem is, monitors age and change over time, so the prefab profile for your monitor can range from somewhat awry to entirely inaccurate. The solution is to create a custom profile, using either a pricey hardware calibrator or an inexpensive software calibrator such as the Pantone Personal Color Calibrator, nicknamed P²C².

P²C² works so easily that you probably won't ever need to read its electronic documentation. You start by selecting the make and model of your monitor or a close equivalent. (Strangely, neither SuperMac nor Radius models are listed, but you can choose a generic Trinitron tube.) Then you answer a series of visual color-matching questions, which test the ways primary colors appear on your screen (see "Calibration by Illusion"). In the end, P²C² generates a ColorSync profile and activates it automati-



Calibration by Illusion P²C² calibrates your monitor by walking you through a series of straightforward visual questions.

ically. Your eye may not be as finely honed as the electronic sensor inside a hardware calibrator, but the results are surprisingly accurate, producing good matches particularly across solid-colored areas.

If any of this sounds familiar, it may be because an early version of P²C² shipped under the name Colorific. What distinguishes P²C² from its OEM predecessor is that it claims to also maintain consistently colored Web graphics from one monitor to another.

Alas, this claim is mostly false. True, P²C² ships with two Netscape Navigator plug-ins for viewing JPEG and TIFF images, but for the plug-ins to work properly, you have to embed your monitor's profile information in each image. And to pull this off, you need to purchase a separate program, Pantone's ColorDrive. On its own, P²C² does nothing whatsoever to ensure reliable Web colors.

Macworld's Buying Advice So long as you're aware that Pantone Personal Color Calibrator is a ColorSync monitor profiler and nothing more, then you'll find it a competent (if not innovative) program that's also easy to use. I wish that it also generated Photoshop monitor-settings files—essential for accurately converting RGB images to CMYK. By marketing P²C² as an Internet solution, Pantone is grossly misrepresenting this product. By itself, P²C² doesn't serve any Web-related function, and Pantone's Web tool, ColorDrive, doesn't need P²C² to embed its ColorSync profiles.—DEKE MCCLELLAND

RATING: ★★★½ **PROS:** Generates ColorSync-compatible monitor profile; easy to use. **CONS:** By itself, does nothing to ensure accurate Web graphics; doesn't save Adobe Photoshop monitor settings. **COMPANY:** Pantone (201/935-5500, www.pantone.com). **LIST PRICE:** \$59.95.

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Hard Drive	4GB SCSI	4GB ULTRA SCSI
Drive Bays	7 total/4 open	7 total/3 open
Total PCI Slots	6	6
Ethernet	10Base-T	10/100Base-T
Ultra-Wide SCSI Card	Optional	Yes
Zip Drive	Optional	Yes
Video Memory	4MB IX Micro	4MB IX Micro

*Special S900base limited time offer: \$1395 for a 250MHz 750 Processor upgrade with 1MB backside cache— see web for details.
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Font Reserve

FONT MANAGEMENT SANS SUITCASES

GIVEN THAT WE ALREADY HAVE three font managers to choose from—Symantec's Suitcase, Alsoft's MasterJuggler, and Adobe's ATM Deluxe—you might wonder if we really need a fourth. But DiamondSoft's Font Reserve 1.0.2 is the first font manager to break the suitcase barrier and handle every conceivable font-management chore from one central location. Although modest-to-moderate font users may find Font Reserve more frustrating than helpful, heavy users who switch projects and typefaces frequently will likely find it a breath of fresh air.

Font Reserve is a major departure from its competitors in several ways. It eliminates the suitcase metaphor and lists individual faces in its main Browser window; you can open and close individual faces and combine them into sets. You can also open fonts and sets permanently or temporarily, and Font Reserve creates a copy when you open a font, so the original can't be corrupted. If you drag your project's fonts out of the Browser window, Font Reserve creates copies you can take to your service bureau. If you \mathbb{A} -click on a font, you can see text



No More Suitcases In Font Reserve's Sets and Fonts lists, icons indicate the font type and stacked circles mark sets containing both open and closed fonts.

in that typeface; a Preview window displays customizable samples, a character-set matrix, and other information.

You can easily add fonts to the Browser list by dragging and dropping them, and you can organize them by almost any criterion. Font Reserve appears to flag nonexistent problems less often than ATM Deluxe does, but it isn't perfect; in some font families, for example, bold and italic outline files are misleadingly reported as orphaned even though they open and print correctly. The program's font-scan log is difficult to read, the fact that System Folder fonts are

treated differently is confusing, and resolving orphaned-file problems can be frustrating. And unlike ATM Deluxe, which can automatically open fonts needed by almost any document, Font Reserve can auto-open fonts only for QuarkXPress documents.

Unlike its competitors, which are extensions, Font Reserve is an invisible background application. That eliminates potential extension headaches and lets you turn Font Reserve on or off anytime, but it also means that the program uses about 2.5MB of RAM and can't be controlled with a program such as Conflict Catcher.

Macworld's Buying Advice Font Reserve is the most flexible—and most expensive—font manager available. Serious font users who are unhappy with their current font manager should take a look at Font Reserve; the rest of us may want to wait until DiamondSoft drops the price or applies a little more polish.—ROBERT C. ECKHARDT

RATING: ★★★½ **PROS:** Manages fonts without suitcases; temporary-open option; powerful list filter; avoids extension hassles. **CONS:** High RAM requirement; auto-opens fonts only for QuarkXPress; rough edges; expensive. **COMPANY:** DiamondSoft (415/381-3303, www.fontreserve.com). **LIST PRICE:** \$119.95.

DiskExpress Pro 3.0

THE BEST DISK OPTIMIZER GETS BETTER

ALISOFT'S DISKEXPRESS HAS long been hailed as the smartest and safest of Macintosh disk optimizers. It's never, however, been the fastest or prettiest; those honors have gone to Symantec's Norton Speed Disk, a component of Norton Utilities. With the new DiskExpress Pro, Alsoft has caught up with the competition's interface, while strengthening its own advantages.

Despite dramatic marketing claims, few users will experience profound disk-performance increases. Routine optimizing makes sense mostly for file servers, but there are solid reasons to optimize desktop systems. For digital video, you need large areas of contiguous free space. To resize a hard-disk partition, you need all your files together at one end of the volume. And defragmenting simplifies the disk directory, making it less susceptible to corruption.

DiskExpress Pro continuously monitors file usage on all or selected disks. With the default "split" optimization, frequently used files are placed at the front of the disk while seldom-used files are stashed at the back. You can also optimize all files to the front



Not Just a Pretty Face-Lift DiskExpress Pro clearly and tastefully packages nearly every feature you'd ever want in a disk optimizer.

of the disk, quickly optimize only frequently used files, optimize for maximum contiguous free space in the shortest time, or optimize selected files.

DiskExpress Pro works in the foreground or unobtrusively in the background. You can schedule automatic optimization for individual disks and assign a variable threshold of how much fragmentation triggers automatic optimizing. DiskExpress Pro can also optimize the active start-up volume; Speed Disk can't.

Moving so much data around creates a risk of significant data loss. Fortunately, DiskExpress Pro puts safety first, testing media and directory integrity before opti-

mizing, and then continually verifying reads and writes as it moves files. I cut the power in the middle of optimizing and didn't lose a byte, although I still wouldn't optimize without a recent backup.

DiskExpress Pro's new interface is a much-needed improvement in form and function over DiskExpress II. The colorful graphic display is easier to read and more informative, and features are more flexible and logically organized. Unfortunately, you can't select multiple disks in the Disk Options dialog, there's no audible notification, and the Optimization display isn't resizable and doesn't show custom disk icons.

Macworld's Buying Advice If you own Norton Utilities, you have a decent optimizer in Speed Disk; if not, DiskExpress Pro alone can't match the value of the entire Norton suite. But if you want features Speed Disk doesn't offer—such as usage-based, background, and scheduled optimizing; or the ability to optimize the start-up volume—there's no better disk optimizer than DiskExpress Pro.—PETER M. STOLLER

RATING: ★★★★½ **PROS:** Safe; flexible; strong usage analysis and automation features. **CONS:** Interface quirks. **COMPANY:** Alsoft (281/353-4090, www.alsoftinc.com). **LIST PRICE:** \$89.95.

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CD-ROM Speed	24X	Serial Ports	2

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Myrmidon 2.0

ONE-CLICK WEB-PAGE CREATION TOOL IS A LITTLE TOO SIMPLE

TERRY MORSE SOFTWARE MAKES a sweeping claim for Myrmidon 2.0: that it lets you turn any Mac file into a Web page with a single click. In actuality, getting this admittedly clever conversion tool to do its job effectively takes considerably more than one click. And while Myrmidon works with any program that has a Print command, it converts some documents a lot more successfully than others.

Myrmidon takes a profoundly simple approach to Web publishing—the program is actually just a printer driver. When you select Myrmidon in the Chooser, it intercepts your files and converts them to HTML documents. Text is rendered as tagged HTML (preserving bold, italics, indents, paragraph spacing, and other formatting), while pictures become GIFs or JPEGs.

Version 2 does give you much more control than earlier versions over how your documents are interpreted; for example, Myrmidon can now split a document into separate Web pages, based on the original page breaks, and create buttons linking the

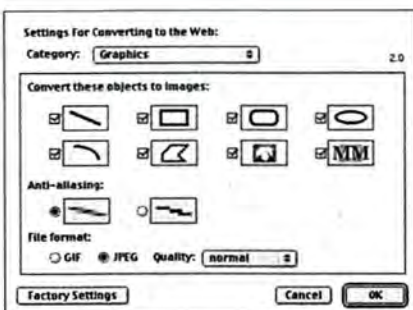


Image Control Myrmidon lets you specify which types of graphics you want to convert, turn on antialiasing, and select a target file format.

pages. The program can generate a table of contents based on headings it finds in a document, preserve the fonts used in a document, and convert URLs to live hyperlinks. Myrmidon also lets you set the default colors for text, backgrounds, and tables and specify antialiasing for images.

Unfortunately, Myrmidon's simple approach leaves much to be desired when it comes to creating anything other than very basic Web pages. For example, you can convert a document's graphics to either GIF or JPEG format but not to a combination of the two. The program also tends to turn anything it can't easily re-create in HTML into a graphic.

Although Myrmidon does an impressive job of reproducing the contents of your document in HTML, preserving the page geometry is not always a good thing—just try reading a double column of small text on the Web. And because Myrmidon recreates pages exactly by embedding invisible tables and spacer GIFs throughout the pages, the result is very bloated HTML. If you do need to edit the code, you'll find the Myrmidon-generated pages messy and almost impossible to work with.

Macworld's Buying Advice Myrmidon isn't for Webmasters or even for beginning Web authors who want to design simple sites; it's strictly for those who want to take basic documents and publish them as is on the Web, without tweaking a single bit of HTML code. Anything even slightly more sophisticated requires real HTML-editing software.—JOSEPH SCHORR

RATING: ★★★ **PROS:** Very easy to use; works with a wide range of applications; converts URLs to live links; can split a document into multiple HTML files. **CONS:** Limited HTML formatting options; can't combine GIF and JPEG images; creates bloated HTML. **COMPANY:** Terry Morse Software (650/858-1017, www.terrymorse.com). **LIST PRICE:** \$99.

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MovieWorks Interactive 4.0

MULTIMEDIA AUTHORING TOOL IS RICH IN FEATURES BUT NOT IN QUALITY

THE PROBLEM WITH MOVIEWORKS Interactive 4.0 isn't the feature list; this entry-level authoring tool from Interactive Solutions is brimming with tools for creating interactive presentations combining sound, graphics, text, and video. This version is notably more stable than earlier incarnations, but the rich feature set doesn't make up for the sluggish, unpredictable performance or the choppy presentations that result.

Among the five modules that make up the program are Paint, a fairly robust painting program with Adobe Photoshop-like tools that let you create original artwork or edit existing digital images; Sound, a 16-bit sound-editing utility; Video, a simple but effective program for capturing and editing QuickTime video; and Player, a royalty-free application for playing back finished presentations.

But the primary module in the MovieWorks suite is Composer, an authoring environment in which you assemble all the elements of your presentation into scenes. Once you've imported pictures, sounds, and text elements into Composer, you can apply transitional effects; create path animations;



Point of View MovieWorks Interactive's TimeView window gives you an overview of all the objects in a scene. You can move and resize the bars to change the entrance, exit, and duration of each object.

and add interactivity by linking scenes, buttons, and other objects.

Assembling a MovieWorks presentation isn't difficult, but to produce one that's smooth and sophisticated, you'll need to overcome Composer's weaknesses: its transitional effects are uninspiring, it still lacks basic drawing tools, you can't apply a pattern or gradient to a background, nudging objects into place with the arrow keys is excruciatingly slow, and the path-

editing tools are complex and unintuitive.

MovieWorks now lets you view individual scenes without rendering them first, but the benefits are limited. For example, you still have to render scenes containing path animations and objects to which you've applied the Dissolve transition. To get smooth playback, I had to render each scene. After rendering, MovieWorks' transitional effects still looked choppy and unpolished. Even the demo presentations don't look very good, consisting mainly of static images with very little animation and only the simplest transitions.

Macworld's Buying Advice Despite some cool features, MovieWorks Interactive makes you struggle to get professional-looking results. E-magine's ProView (see *Reviews*, December 1997) is a better choice for quick, easy multimedia authoring, and it allows playback on Windows machines as well as Macs.—JOSEPH SCHORR

RATING: **PROS:** Rich painting, sound, and video tools; supports antialiased text; includes royalty-free player application. **CONS:** Poor playback quality; some effects require rendering before playback; no Windows support. **COMPANY:** Interactive Solutions (510/734-0730, www.movieworks.com). **LIST PRICE:** \$129.95.

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MacX 2.0

AN INEXPENSIVE WINDOW TO X

WHEN WE LAST LOOKED AT X Window terminal-emulation software, Apple's MacX 1.5 wasn't up to speed with competing products (see "Through the X Window," May 1996). With MacX 2.0, Apple has cut the price of its offering in half while significantly updating the product's feature set, making MacX a viable alternative to its nearest competitors.

MacX employs a user interface virtually identical to its predecessor's—one that's easy to configure and use. Most MacX improvements are invisible: the product now sports native Open Transport support; compliance with the X11R6.1 standard (MacX 1.5 lagged two revisions behind, at X11R5); and improved performance, courtesy of multithreading.

Like previous versions, MacX 2.0 supports both Motif and Open Look window managers and proprietary extensions for IBM's AIX and DEC's DECWindows. And MacX still fields the standard set of X Window extensions: XIE (X Imaging Extensions), XDMP (X Display Manager Protocol), XLFD (X Logical Font Description),



The Joy of X MacX 2.0 lets you run Unix applications, using the Mac's familiar user interface.

and enhanced shape drawing. You can run the program in rooted mode, in which X Window takes over your entire screen, or in rootless mode, where each client X window appears as a standard Macintosh window alongside your other Mac applications.

When you launch an X client application, you'll notice some serious performance enhancements over previous MacX versions. Clients start up much more quickly, due to improved Open Transport networking, and graphically intense applications run significantly faster than in the previous release.

I tested MacX with several Unix operating systems: IBM's AIX, Silicon Graphics' IRIX, and Sun Microsystems' Solaris. The program worked amazingly well, even

with many notoriously finicky IRIX clients that befuddled MacX 1.5. (Like all other X emulators, MacX lacks support for IRIX's proprietary DGL extensions.) Apple's documentation doesn't mention support for Bézier curves, but clients using this feature ran without any problem. The only real operational limitations are lack of support for 24-bit and device-independent color, and missing Telnet and rlogin client-launch capabilities. Neither shortcoming is a show-stopper, however, and most MacX users won't notice the limitations.

Macworld's Buying Advice MacX was once a poor stepchild in the X Window-emulator family, but Apple's 50 percent price cut—plus up-to-date compatibility and improved network performance—makes it a vigorous contender. If you need advanced features, buy a high-end product at twice the price. For basic X Window access, MacX is all you'll need.—MEL BECKMAN

RATING: ★★★ **PROS:** Inexpensive; X11 version 6.1 support; permits mixed Mac and X Window user interface; excellent performance. **CONS:** No 24-bit or device-independent color; Telnet and rlogin client launch not supported. **COMPANY:** Apple Computer (415/996-1010, www.apple.com). **LIST PRICE:** \$150.

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MacVector 6.0

ALL-IN-ONE BIOINFORMATICS PROGRAM

MACVECTOR STARTED LIFE, along with AssemblyLIGN (now part of MacVector), as a result of Eastman Kodak's foray into biotechnology. Now that Kodak has regrouped around image processing, Oxford Molecular Group has acquired MacVector and made some important upgrades. At the moment, MacVector 6.0.1 is the most complete molecular-biology system for maintaining and analyzing nucleic acid and protein sequences.

The big new feature is built-in access to the Entrez database, maintained by the National Center for Biotechnology Information. A single MacVector command connects to the database, opens the browser window, and allows access to almost any published protein or nucleic acid sequence, regardless of its source. Although this mini-browser can't match Netscape Navigator at presenting information, it does let you use sequences found in a search without any manual reformatting. Version 6 also implements the five BLAST (basic linear alignment search tools) homology search functions for sequence exploration on the



Genes Online MacVector's connection to the huge Entrez database needs no special setup.

Internet in foolproof, Mac-style dialog boxes instead of Unix command lines. In addition, this version fixes earlier glitches in file transfers across firewalls.

Another major addition is the now standard Clustal W algorithm for exploring the alignment of multiple protein and peptide sequences. Earlier versions of MacVector couldn't compete with DNASTar's LaserGene or Gene Codes' Sequencer at alignment tasks; this version can compare up to 100 sequences of several thousand residues in minutes on a 200MHz Power Mac. The ancient but competent AssemblyLIGN is also included for comparing the alignment of nucleic acid sequences.

MacVector 6.0.1 also offers an icon-

managed sequence editor that's well integrated with the program's other molecular-biology functions—translation, restriction analysis, primer and probe analysis, protein-structure prediction, and motif analysis. Another nice touch is the ability to compute predicted sequence-based melting curves for DNA and RNA structures.

MacVector does have minor interface flaws—you can't size the browser horizontally, and some windows lack a horizontal scroll bar. And customer support can take a few days to respond to serious questions, although the answers are worth the wait.

Macworld's Buying Advice In recognizing the importance of connecting to online sequencing results, MacVector 6.0.1 represents a big step forward in molecular-biology sequencing software. It's more expensive than working up your own solution from bits and pieces of commercial and public-domain programs, but it's an excellent choice for labs where sequencing is a main focus.—CHARLES SEITER

RATING: **PROS:** Fast; includes most-needed functions; simple Web database access. **CONS:** Minor interface flaws. **COMPANY:** Oxford Molecular Group (408/879-6300, www.oxmol.com). **LIST PRICE:** \$2,950.

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Imperialism

SIMULATOR BLENDS WAR, DIPLOMACY

EVEN THOUGH THE GAME OFFERS only three historically based scenarios, *Imperialism* does an excellent job of portraying how the increase of industry in the nineteenth century led to an imperialist frenzy of vicious wars, diplomatic back stabbings, and murderous trade policies. As the world's great powers seek expanded access to resources and international markets, you must build your industry from scratch, harvesting the limited resources within your own territory and using diplomacy and force to secure more.

To succeed, you must manage resources, industries, and rail and nautical transport while maintaining trade relations with potential colonies and building a strong military—a seemingly daunting juggling act for those who prefer simple games. In actuality, *Imperialism's* streamlined interface cuts down micromanagement to a reasonable level. Industry, transport, and diplomacy are separated into simple screens that don't make you remember the precise location of every item in your empire. If this scenario proves too much, the game offers seven pregenerated scenarios as tutorials.



Ours Is Not to Reason Why In *Imperialism*, if the computer determines that you lack the necessary artillery to attack, you can lose battles even if you possess the overwhelming manpower necessary to win.

Although warfare plays an important role in *Imperialism*, the game's so-called tactical battle option offers little that resembles realistic tactics of any kind. Battle maps are small, repetitive, and difficult to maneuver. Unfortunately, it's necessary to play tactically in certain instances. If you send troops with insufficient artillery support to attack a fortified enemy position, the computer commander automatically retreats your troops—even if you have enough men to overwhelm the enemy artillery (see "Ours Is Not to Reason Why").

On a larger, strategic level, *Imperialism's* portrayal of military relations is much

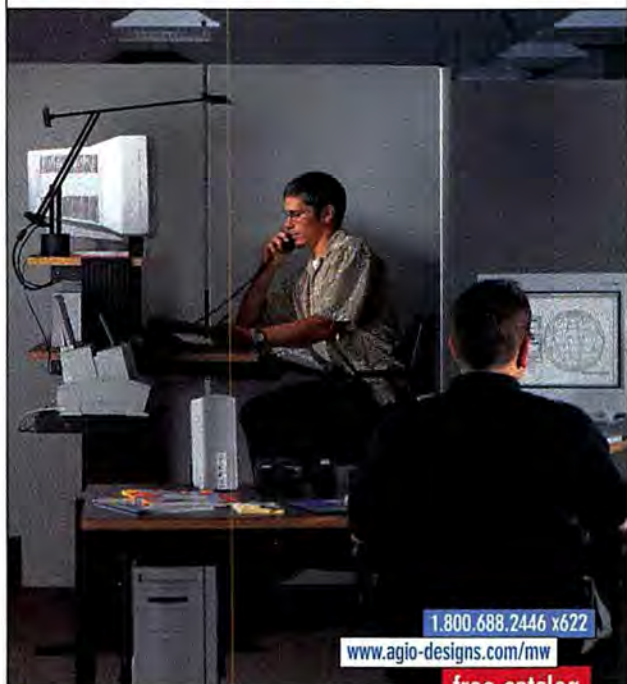
more realistic. Rely solely on your military to protect your interests, and you quickly find yourself destitute and friendless, relegated to minor-nation status. The balance of diplomacy, industry, and military force is *Imperialism's* strong point.

Alas, *Imperialism* lacks the flash of other recent games. Focusing instead on the realism of the underlying scenarios, the game offers graphics and music that barely meet minimum standards. Network play is available via both AppleTalk and TCP/IP, but be warned: an average game against the computer takes several days, and games against humans may take even longer.

Macworld's Buying Advice A well-balanced game that effectively simulates nineteenth-century politics, *Imperialism* stumbles over its dearth of historical scenarios and tactical realism. But despite these weaknesses, engrossing play provides strategy buffs plenty of enjoyment.—DANIEL MADAR

RATING: ★★★½ **PROS:** Accurately portrays the effect of industrialization on world politics; easy to use; deeply involved game play. **CONS:** Weak military tactics; substandard graphics and sound. **COMPANY:** Frog City/SSI (408/737-6800, www.imperialism.com). **COMPANY'S ESTIMATED PRICE:** \$49.95.

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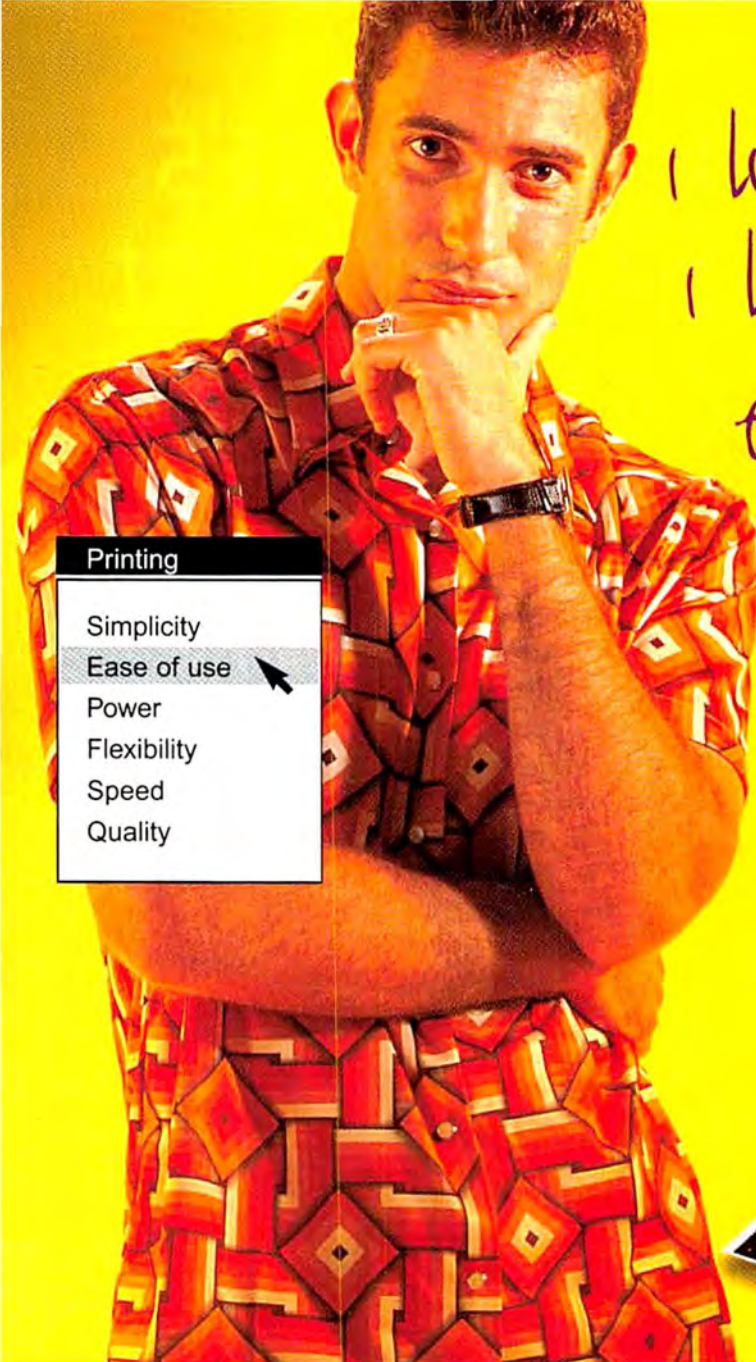
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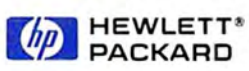
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Mouse Ratings

HARDWARE AND SOFTWARE PRODUCTS AT A GLANCE

Macworld's Mouse Ratings let you compare Macintosh products from the past year based on the authoritative assessments in our reviews and features.

What the Scores Mean The number of mice indicates the product's level of quality; the chart at the bottom of the page shows the meaning for each quality level. For products that rate in the top half of a quality level, we add a half mouse to the score.

We evaluate seven factors to derive the Mouse Rating: feature set, design implementation, performance, reliability, ease of use, innovation, and value. We take these evaluations, weight their importance for each class of product, and calculate the final rating.

Mice versus Stars Until this issue, Macworld used Star Ratings, which included a number of stars to indicate quality followed by a precision rating, such as ★★★★★7.8. Macworld now uses mice, with a mouse equal to a star. When comparing current Mouse Ratings with original Star Ratings, use this chart to translate the scores:

Mouse Rating	Star Rating	Precision Rating
★★★★	★★★★★	9.0-10.0
★★★★½	★★★★	8.0-8.9
★★★★	★★★★	7.0-7.9
★★★★½	★★★	6.0-6.9
★★★★	★★★	5.0-5.9
★★★★½	★★	4.0-4.9
★★★★	★★	3.0-3.9
★★★★½	★	2.0-2.9
★★★★	★	0.0-1.9

Editors' Choice This section also lists products that have been awarded an Editors' Choice designation in a Macworld product comparison. That designation indicates a best-of-class product for a particular need.

Ratings Online The ratings listed here are of recently reviewed products in select categories. For a complete, searchable list, go to Macworld Online, at www.macworld.com/buyers/.

Full Reviews To read a full review of any product in the listing, please consult the issue indicated at the end of the listing or search for the product via Macworld Online (keyword Macworld on America Online; URL www.macworld.com on the World Wide Web). If a product has been upgraded since our last assessment, the most recent version number appears in parentheses after the main reviewed-version number.

Vendors: Please write to Macworld Mouse Ratings, 501 Second St., San Francisco, CA 94107, to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS

★★★★½ **4th Dimension 6.0**, ACI US, 408/252-4444, \$299. Classic relational database does Windows and the Web. *Aug 97, p. 62*

★★★ **Act 2.8**, Symantec, 408/253-9600, \$170. Act adds little to the genre; Now's PIM duo is a superior choice. *Jan 98, p. 42*

★★★★ **ActivStats 1.0**, Addison-Wesley Benjamin/Cummings, 800/822-6339, \$30. A complete basic statistics package that's great for all-around use. *Sep 97, p. 66*

★★½ **Ascend 4.0**, Franklin Quest, 801/975-1176, \$100. Information manager isn't competitive with other PIMs. *Apr 97, p. 72*

★★★★½ **ClarisWorks Office**, Claris, 408/727-8227, \$99. Integrated package is still a suite deal. *Jan 98, p. 41*

★★★★ **Data Desk Plus 6.0**, Data Description, 607/257-1000, \$795. Latest version of statistics pioneer is better, not bigger. *Oct 97, p. 60*

★★ **ePaper 1.5**, Second Glance Software, 360/692-3694, \$169. Offers some markup tools, but if you're serious about OCR, invest in a dedicated package. *Jun 97, p. 64*

★★★★½ **FloStat 2.0**, Senecio Software, 419/352-4371, \$149 (\$49 student version). Fast statistical analysis software designed for the social sciences. *Sep 97, p. 66*

★★ **FormTyper 1.0**, Visioneer, 510/608-0300, \$20. Forms software is cheap and easy to use, but it's too underpowered. *Aug 97, p. 54*

★★ **Front Office 1.6 LE**, STF Technologies, 816/220-0100, \$59. A bad temp wouldn't garble your phone messages this badly. *Jun 97, p. 66*

★★★★ **Helix Express 4.5**, Helix Technologies, 847/465-0242, \$795. Venerable application is an excellent tool for developing vertical-market databases. *Oct 97, p. 56*

★★★ **InfoGenie 2.0**, Casady & Greene, 408/484-9228, \$80. Updated information manager adds links to Web browsers. *Jun 97, p. 84*

★★★★ **Informed Designer 2.0**, Shana, 403/433-3690, \$295. If you're serious about forms, this feature-rich designer can't be beat. *Aug 97, p. 54*

★★★★½ **LetterRip 1.0.2**, Fog City Software, 408/454-1405, \$295. Mailing-list server is both simpler and

cheaper than ListStar. *Jun 97, p. 77*

★★★★½ **ListStar 1.1**, StarNine Technologies, 510/649-4949, \$499. Serious mailing-list management with industrial-strength tools. *Jun 97, p. 77*

★★½ **Lotus Organizer 97 GS**, Lotus Development, 617/577-8500, \$85. Consider Lotus Organizer only if you're using Lotus Notes and need group scheduling. *Jan 98, p. 42*

★★★★½ **Mathematica 3.0**, Wolfram Research, 217/398-0700, \$1,295. Leading product in math market, ideal for symbolic computation. *May 97, p. 62*

★★★★½ **MathType 3.5**, Design Science, 562/433-0685, \$199. Ideally suited to instructional equation writing; now Web-ready. *Jan 98, p. 60*

★★★★½ **MATLAB 5**, The MathWorks, 508/647-7000, \$1,795. Still the fastest route to solutions in industrial math. *Jul 97, p. 74*

★★★★½ **MYOB Accounting 7**, BestWare, 201/586-2200, \$90 to \$140. Entry-level accounting package combines ease of use and power. *May 97, p. 69*

★★½ **Nisus Writer 5.0**, Nisus Software, 619/481-1477, \$249. Renegade word processor is long on innovation, short on basics. *Apr 97, p. 56*

★★★★½ **Now Contact and Up-to-Date 3.6.5**, Now Software, 503/274-2800, \$100. Personal info-management duo gets connected to the Net. *Jun 97, p. 70*

★★½ **Now Synchronize 1.0**, Now Software, 503/274-2800, \$40. Disastrous PDA-to-PIM link for Pilot. *Aug 97, p. 70*

★★★★ **Numbers & Charts 1.0.1**, Adrenaline, 418/658-9909, \$150. OpenDoc spreadsheet parts show the promise of component software. *Aug 97, p. 64*

★★ **OmniForm 2.0**, Caere, 408/395-7000, \$149. Accurate but quirky program is handy if you need to scan existing forms. *Aug 97, p. 54*

★★★★ **OmniPage Pro 7.0**, Caere, 408/395-7000, \$499. OCR package has improved interface but not accuracy. *Jun 97, p. 83*

★★½ **Online Army Knife 1.2**, JEM Software, 303/422-4766, \$70. Add-on spelling checker is fast and Internet-savvy but has some rough edges. *Jun 97, p. 62*

★★★★ **Phyla 2.0**, Mainstay, 805/484-9400, \$299 (\$599 developer version). Phyla 2.0 succeeds with a graphical approach. *Oct 97, p. 56*

★★★★ **PowerBuilder 5.0**, PowerSoft, 508/287-1500, \$2,995. Key cross-platform database tool puts Mac's SQL skills on par with Unix and NT. *Apr 97, p. 70*

★★★★ **Prism 2.0**, CrapPad Software, 619/457-3909, \$495. Ideal statistics package for the "wet" sciences *continues*

REAL PRODUCTS
REAL RATINGS

Reviews you can trust: Macworld rates only final shipping products, not prototypes. What we review is what you can actually buy.

OUTSTANDING: ★★★★★ VERY GOOD: ★★★★ GOOD: ★★★ FLAWED: ★★ UNACCEPTABLE: ★

Mouse Ratings

—chemistry, biology, and so forth. *Sep 97, p. 66*

- ◆◆◆½ **Quicken Deluxe 98**, Intuit, 415/944-6000, \$60. New version adds even more goodies to a popular product. *Jan 98, p. 38*
- ◆◆◆½ **Scorpio 1.1**, Abbott Systems, 914/747-4201, \$29. Minuscule word processor's price is its best feature. *Sep 97, p. 78*
- ◆◆◆ **Spell Catcher 1.5.7**, Casady & Greene, 408/484-9228, \$60. Fast, well-designed spelling checker. *Sep 97, p. 130*. **Editors' Choice** for best utilities.
- ◆◆½ **Spellswell Plus 2.1.1**, Working Software, 408/423-5696, \$15. Add-on spelling checker doesn't live up to its name. *Jun 97, p. 62*
- ◆◆◆½ **SpellTools 1.2.1**, Newer Technology, 316/943-0222, \$20. Add-on spelling checker has text-to-speech feature but no interactive checking. *Jun 97, p. 62*
- ◆◆◆ **Spreadsheet 2000 2.01**, Casady & Greene, 408/484-9228, \$110. This LKISS successor is ready for business. *Jul 97, p. 68*
- ◆◆◆ **ViewOffice PowerSuite**, NewSoft, 510/445-8600, \$79. Inexpensive scanning with solid image-editing tools but unimpressive OCR features. *Jun 97, p. 64*
- ◆◆◆½ **Wingz 2.1.1**, Investment Intelligence Systems Group, 913/663-4472, \$399. Powerful programming tool disguised as a spreadsheet. *May 97, p. 71*

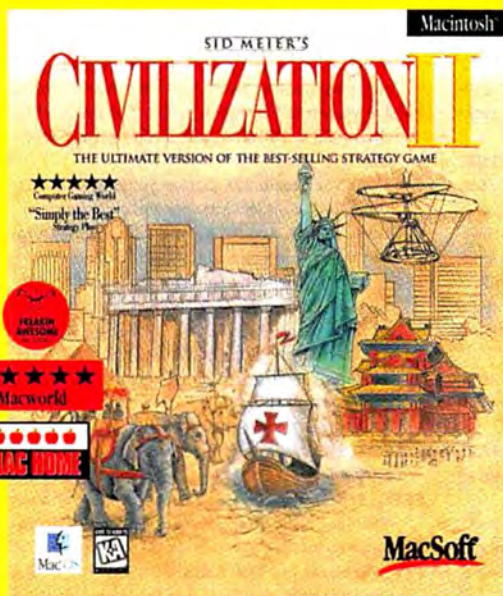
EDUCATION/ENTERTAINMENT

- ◆◆◆½ **3D Atlas 98**, Creative Wonders, 650/482-2300, \$30. CD for those with incurable wanderlust. *Jan 98, p. 98*
- ◆◆◆½ **3D Landscape 2.0**, Books That Work, 415/326-4280, \$60. Armchair gardening made easy. *Apr 97, p. 80*
- ◆◆◆½ **Abuse**, Bungie Software, 312/563-6200, \$40. Breathes new life into the old side-scroller arcade-game genre. *Jun 97, p. 94*
- ◆◆◆ **ActivChemistry 1.0**, Salamander Interactive/Addison-Wesley, 415/854-0300, \$20. A multimedia approach to first-year chemistry. *Aug 97, p. 82*
- ◆◆◆ **The Adventures of Tom Sawyer**, Southern Star Interactive, 212/473-1175, \$35. Mark Twain's classic novel goes digital in style. *Aug 97, p. 82*
- ◆◆◆½ **Alley 19**, Starplay Productions, 303/447-9562, \$40. Bowling game for the nostalgic. *Apr 97, p. 82*
- ◆◆◆½ **American Heritage Talking Dictionary**, SoftKey, 617/494-1200, \$40. A pronounced success. *Aug 97, p. 82*
- ◆◆◆½ **Arthur's Reading Race**, Broderbund, 415/382-4400, \$30. Endlessly amusing game teaches reading skills. *Aug 97, p. 82*
- ◆◆◆ **Awesome Animated Monster Maker**, Houghton Mifflin Interactive, 617/503-4800, \$35. Create the monster of your dreams—or nightmares. *Jan 98, p. 98*
- ◆◆◆½ **Big Science Comics**, Theatrix Interactive, 510/658-2800, \$30. An animated comic-book CD complete with counting games and puzzles. *Jan 98, p. 87*
- ◆◆◆ **Body Voyage**, Time Warner Electronic Publishing, 310/581-5818, \$40. A chillingly realistic 3-D look at human anatomy. *Aug 97, p. 82*
- ◆◆◆ **Britannica CD 97**, Encyclopedia Britannica, 800/747-8503, \$150. For sheer comprehensiveness, it's tough to beat this reference CD. *Jan 98, p. 87*
- ◆◆◆ **Canon Photography Workshop**, Multicom, 206/622-5530, \$20. Improve your photos through hands-on lessons. *Jan 98, p. 87*
- ◆◆◆½ **Castle Explorer**, DK Multimedia, 440/572-0725, \$30. Beautiful, but slow. *Jan 98, p. 87*
- ◆◆◆½ **The Cigar Companion Interactive 2.0**, Inroads

- Interactive, 303/444-0632, \$20. A gift for cigar lovers that won't stink up the house. *Jan 98, p. 98*
- ◆◆◆ **Command & Conquer**, Westwood Studios, 702/228-4040, \$60. Much-anticipated war game is innovative and challenging. *May 97, p. 84*
- ◆◆ **Cosmopolitan Virtual Makeover**, SegaSoft, 888/734-2763, \$40. A poor replacement for being invited to a *Ricki Lake* makeover special. *Jan 98, p. 98*
- ◆◆◆ **Creatures**, Mindscape Entertainment, 408/737-6800, \$40. Hatch and raise little reptile pets. *Jan 98, p. 80*
- ◆◆◆½ **CyberSound Studio 2.0**, InVision Interactive, 415/812-7380, \$100. Bargain music studio has great sounds; some bugs need to be fixed. *May 97, p. 76*
- ◆◆½ **Damage Incorporated 1.0**, MacSoft, 612/509-7600, \$35. 3-D action/strategy game shoots itself in the foot. *Aug 97, p. 80*
- ◆◆◆ **Duke Nukem 3D: Atomic Edition**, MacSoft, 612/509-7600, \$50. Take on hordes of invading aliens; contains violence and sexual content. *Jan 98, p. 80*
- ◆◆◆½ **Easy Grade Pro 3.0**, Orbis Software, 206/848-6899, \$49. Lets teachers keep a year's classes in one grade-book file. *Aug 97, p. 82*
- ◆◆◆ **Elle Cooking**, Grolier Interactive, 203/797-3530, \$30. This CD's simple interface and 2,000 recipes are perfect for busy cooks. *Jan 98, p. 87*
- ◆◆◆ **Exotic Sushi**, Bandai Digital Entertainment, 714/816-9700, \$30. Learn customs they don't teach you at the local sushi bar. *Jan 98, p. 98*
- ◆◆◆ **Eyewitness Virtual Reality Earth Quest**, DK Multimedia, 440/572-0725, \$30. Explore a 3-D rendering of Earth's interior, and learn about natural phenomena. *Jan 98, p. 87*
- ◆◆◆½ **F/A-18 Hornet 3.01**, Graphic Simulations, 972/386-7575, \$30. Plenty of data and realistic cockpit-system simulations. *Jan 98, p. 80*
- ◆◆½ **Family Tree Maker Deluxe Edition II 3.0.2**, Broderbund Software, 415/382-4700, \$90. Genealogy software lags in performance and features. *Jan 98, p. 50*
- ◆◆◆½ **FDR**, Corbis, 206/641-4505, \$40. Learn about the life of Franklin Delano Roosevelt. *Jan 98, p. 87*
- ◆◆◆ **Freddie Fish 2: The Case of the Haunted Schoolhouse**, Humongous Entertainment, 206/486-9258, \$40. An amusing underwater adventure, complete with ghosts. *Jan 98, p. 87*
- ◆◆◆½ **Gene Inspector 1.0**, Textco, 603/643-1471, \$2,599 (\$1,899 education sites). An essential component of any molecular biology lab. *Sep 97, p. 90*
- ◆◆◆½ **Gridz 1.0**, Green Dragon Creations, 601/473-4225, \$35. Stake out a claim in a NetSpace battleground and defend your turf. *Jan 98, p. 80*
- ◆◆◆ **How Many Bugs in a Box?**, Simon & Schuster Interactive, 212/698-7000, \$20. Brightly colored CD includes eight simple counting games. *Jan 98, p. 87*
- ◆◆◆ **Interactive Geography**, Perian Spring, 503/222-2044, \$45. Whole-earth CD. *Aug 97, p. 82*
- ◆◆◆½ **The Last Express**, Red Orb Entertainment/Broderbund Software, 415/382-4777, \$40. A murder mystery on the Orient Express. *Jan 98, p. 80*
- ◆◆◆ **Leonardo da Vinci**, Corbis, 206/641-4505, \$50. This richly detailed CD lets you explore a gallery of Leonardo da Vinci's work. *Jan 98, p. 87*
- ◆◆◆½ **Links LS Macintosh**, Access Software, 801/359-2900, \$50. Simulation game manages to capture most of golf's elusive essence. *Jan 98, p. 80*
- ◆◆◆ **The Louvre Museum**, The Voyager Company, 800/446-2001, \$40. Art appreciation CD-ROM geared to the younger generation. *Sep 97, p. 92*
- ◆◆◆ **MacSpartan Plus 1.1**, Wavefunction, 714/660-6101, \$999 (\$449 education sites). Puts serious computer chemistry in every lab. *Sep 97, p. 84*
- ◆◆½ **Mario Teaches Typing 2**, Brainstorm, 714/553-9557, \$30. Lackluster games hinder this second-rate tutorial. *Aug 97, p. 82*
- ◆◆◆ **Math Advantage**, Aces Research, 510/683-8855,

- \$40. Self-paced CD-ROM set surpasses its textbook-on-disc competitors. *Aug 97, p. 82*
- ◆◆◆½ **Mathcad Plus 6**, MathSoft, 617/577-1017, \$349. Despite new features, math program still needs refinement. *Apr 97, p. 78*
- ◆◆◆½ **Math Heads**, Theatrix Interactive, 510/658-2800, \$30. Helps kids hone math skills. *Jan 98, p. 87*
- ◆◆◆ **Multimedia I Ching**, Princeton University Press, 800/777-4726, \$50. CD version of the Book of Changes is no mere magic eight ball. *Jan 98, p. 98*
- ◆◆◆ **A Night to Remember**, Voyager, 800/446-2001, \$30. Immerse yourself in the details of the Titanic's famous demise with this CD. *Jan 98, p. 87*
- ◆◆◆ **Obsidian**, Rocket Science Games/SegaSoft, 888/734-2763, \$40. Myst-like puzzle game transcends many of its genre's faults. *Sep 97, p. 90*
- ◆◆◆ **Orly's Draw-A-Story**, Broderbund Software, 415/382-4400, \$29. The pictures you draw come to life in this cool multimedia storytelling CD. *Jan 98, p. 87*
- ◆◆◆ **Overture 2.01**, Opcode Systems, 415/856-3333, \$495. It's not just a fast, simple sheet-music factory. *Sep 97, p. 74*
- ◆◆◆½ **Pajama Sam in "No Need to Hide When It's Dark Outside"**, Humongous Entertainment, 206/486-9258, \$40. Problem-solving puzzles for kids. *Jan 98, p. 87*
- ◆◆◆ **Perseus 2.0**, Yale University Press, 800/987-7323, \$350. A virtual tour of ancient Greece. *Aug 97, p. 82*
- ◆◆◆ **Picasso: The Man, His Works, The Legend**, Grolier Interactive, 203/797-3530, \$40. This CD lets you explore the life and work of Picasso. *Jan 98, p. 87*
- ◆◆◆½ **Power3D**, TechWorks, 512/794-8533, \$250. Gamers need look no further for accelerated 3-D graphics. *Jan 98, p. 64*
- ◆◆◆½ **Preschool Mother Goose**, Piranha Interactive, 602/491-0500, \$40. Nursery rhymes tutor and entertain the wee ones. *Aug 97, p. 82*
- ◆◆◆½ **The Psychedelic Bus of Dead Knowledge**, Cosmic Light Computing, 804/823-7766, \$50. Dead-head band-trivia knowledge needed. *Jan 98, p. 98*
- ◆◆◆½ **Putt Putt Travels Through Time**, Humongous Entertainment, 425/486-9258, \$40. Helps kids master problem-solving skills. *Jan 98, p. 80*
- ◆◆◆½ **Quake 1.08.3**, MacSoft, 612/509-7600, \$50. Customizable point-and-kill game. *Jan 98, p. 80*
- ◆◆◆ **Ready to Read with Pooh**, Disney Interactive, 818/543-4300, \$35. Kids will love the chance to learn and play. *Jan 98, p. 87*
- ◆◆◆½ **Reunion 3.0.2**, Leister Productions, 717/697-1378, \$100. Well-organized, flexible genealogy program. *Jan 98, p. 50*
- ◆◆◆½ **Riven**, Red Orb Entertainment/Broderbund Software, 415/382-4777, \$50. Myst's sequel tops the original in almost every respect. *Jan 98, p. 80*
- ◆◆ **Santazia**, Caspari, 203/888-1100, \$30. A digital advent calendar. *Jan 98, p. 98*
- ◆½ **Screen To Screen 1.02**, Power On Software, 612/317-0344, \$150. Screen sharing program has some serious flaws. *Sep 97, p. 68*
- ◆◆◆½ **Starry Night Deluxe 2.0**, Sierra Software, 416/926-2174, \$90. Photo-realistic sky simulator for serious and casual stargazing. *Jun 97, p. 92*
- ◆◆◆ **Super Jewelry Kit**, Print Paks, 503/295-6564, \$25. Design and create custom jewelry. *Jan 98, p. 98*
- ◆◆◆ **Teams That Work**, Harvard Business School Publishing, 617/496-1449, \$295. Pricy CD teaches how to work effectively in teams. *Jan 98, p. 87*
- ◆◆◆½ **Treasures of the American Museum of Natural History**, Voyager, 800/446-2001, \$40. Explore the halls and exhibits of the AMNH. *Jan 98, p. 87*
- ◆◆ **Ultimate Family Tree Deluxe**, Palladium Interactive, 812/829-4405, \$60. Confusing, painfully slow, and an inconsistent interface. *Jan 98, p. 50*
- ◆◆◆ **Ultimate Writing and Creativity Center**, The *continues*

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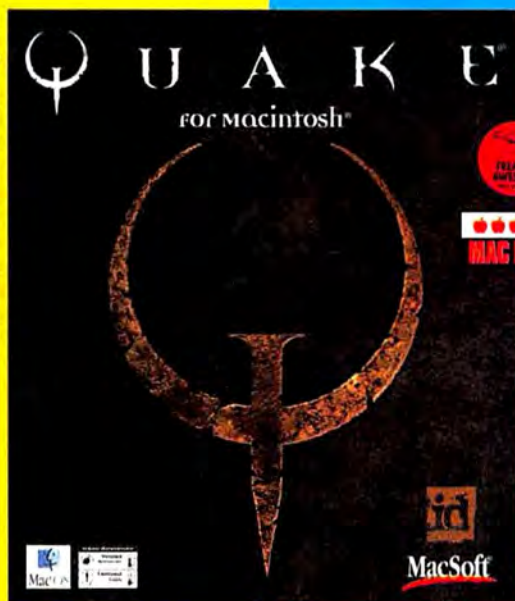


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Mouse Ratings

Learning Company, 617/494-1200, \$35. Easy way for kids to brainstorm writing ideas. *Aug 97, p. 82*

★★★★½ **Virtual Wings**, Cat 3 Systems, 800/322-8866, \$119. Low-cost flight simulator. *Jan 98, p. 98*

★★★★½ **Williams-Sonoma Guide to Good Cooking**, Broderbund Software, 415/382-4400, \$40. CD makes finding the right recipe easy. *Jan 98, p. 87*

★★★★ **Witness to the Future**, Voyager, 800/446-2001, \$40. CD that explores the environmental problems faced by three communities. *Jan 98, p. 87*

★★★★½ **The Wonders of Rocks and Minerals**, Tasa Graphic Arts, 505/293-2727, \$59. Rock-solid earth-science lessons on CD. *Aug 97, p. 82*

GRAPHICS

★★★★½ **3D WalkAround 1.0**, Abracadata, 541/342-3030, \$100. Unsuitable for architectural projects, but fine for simple interior space planning. *Jun 97, p. 81*

★★★★ **CADtools 1.0**, Hot Door, 562/438-0377, \$129. Thirty-three Illustrator drafting tools. *Nov 97, p. 64*

★★★★ **Canvas 5.0.2 (5.0.3)**, Deneba Software, 305/596-5644, \$599. Tons of tools but a merely adequate package. *Nov 97, p. 74*

★★★★ **Color It 3.2**, MicroFrontier, 515/270-8109, \$150. This solid, powerful, low-cost image editor runs well on slower Macs. *Nov 97, p. 107*

★★★★ **ColorWeb 1.0**, Pantone, 201/935-5500, \$30. Simple, inexpensive color picker and swatch book move to the Web. *May 97, p. 84*

★★★★½ **DesignWorkshop 1.5**, Artifice, 541/345-7421, \$595. Low-end modeler offers excellent modeling tools. *Apr 97, p. 74*

★★★★½ **Expression 1.0**, Fractal Design, 408/688-5300, \$449. Object-oriented natural-media drawing arrives. *Mar 97, p. 50*

★★★★½ **Extreme 3D 2.0**, Macromedia, 415/252-2000, \$399. Great 3-D design program for print, animation, Web, and multimedia. *Apr 97, p. 70*

★★★★ **Eye Candy 3.0**, Alien Skin Software, 919/832-4124, \$199. Lots of eye-catching Photoshop filters. *Aug 97, p. 58*

★★★★½ **Flash 2.0**, Macromedia, 415/252-2000, \$199. Cool features differentiate this mid price from the rest of the pack. *Sep 97, p. 62*

★★★★½ **Full Pixel Search 2.0**, Avian Systems, 201/568-9494, \$295. Image-analysis program finds a pixel in a haystack. *Mar 97, p. 84*

★★★★ **HotShots 1.0**, PictureWorks Technology, 510/855-2001, \$130. Excellent image-enhancement features, strong editing tools. *Nov 97, p. 107*

★★★★ **Illustrator 7.0**, Adobe Systems, 415/961-4400, \$595. Slight upgrade marks a new beginning for venerable graphics app. *Aug 97, p. 46*

★★★★½ **IntelliHance 3.0**, Extensis, 503/274-2020, \$100. This plug-in provides one-button image enhancement with great results. *Nov 97, p. 107*

★★★★ **Kal's Photo Soap 1.0**, MetaCreations, 805/566-6220, \$50. Basic image editor offers slick features and gorgeous but complex interface. *Nov 97, p. 107*

★★★★½ **MiniCAD 7**, Diehl Graphsoft, 410/290-5114, \$795. CAD champion gets a solid upgrade. *Sep 97, p. 73*

★★★★ **ObjectDancer 1.1**, PaceWorks, 415/261-6180, \$445. Offers precise timeline and object-oriented animation controls. *Sep 97, p. 62*

★★★★ **Painter 5**, MetaCreations, 408/430-4100, \$449. Painter is still demanding to learn, but no artist should be without it. *Sep 97, p. 65*

★★★★ **PhotoDeluxe 1.1**, Adobe Systems, 408/536-6000, \$49. Nice hand-holding features, but complex and

undocumented advanced modes. *Nov 97, p. 107*

★★★★ **PhotoTools 1.1**, Extensis, 503/274-2020, \$100. Polished collection of Photoshop filters includes a great text plug-in. *Aug 97, p. 58*

★★★★½ **Poser 2.0**, Fractal Design, 408/430-4100, \$249. Human models in 3-D (clothing optional). *Mar 97, p. 76*

★★★★½ **ScanPrepPro 3.1**, ImageXpress, 770/564-9924, \$695. Photoshop plug-in puts image processing on autopilot. *Mar 97, p. 80*

★★★★ **Texture Creator 2.0**, Three D Graphics, 310/553-3313, \$130. Pro-level features in a beginner's package. *Aug 97, p. 76*

★★★★ **VectorTools 2.0**, Extensis, 503/274-2020, \$100. Plug-in package gives Illustrator and FreeHand a feature infusion. *Nov 97, p. 64*

★★★★ **Vertigo 3D Dizzy**, Vertigo Technology, 604/684-2113, \$119. Uncooperative 3-D environment, limited lighting tools, but inexpensive. *Sep 97, p. 80*

★★★★½ **Vertigo 3D Words 1.0**, Vertigo Technology, 604/684-2113, \$119. 3-D text enhancements for Illustrator. *Nov 97, p. 64*

★★★★½ **Virtual Home Space Builder 2.0.4**, ParaGraph, 408/364-7700, \$49. VRML 2.0 authoring program has limited modeling features. *Aug 97, p. 68*

★★★★ **WalkThrough Pro 2.6**, Virtus, 919/467-9700, \$495. Best choice to quickly and elegantly create an architectural walk-through. *Jun 97, p. 81*

★★★★½ **WebAnimator 1.1**, DeltaPoint, 408/648-4000, \$50. Limited drawing tools and motion controls make it best suited for static animations like banner ads and simple logos. *Sep 97, p. 62*

★★★★½ **WebCollage 1.01**, StarNine Technologies, 510/649-4949, \$249. Add automatic infographics to your Web site. *Nov 97, p. 71*

★★★★½ **WebPainter 1.0**, Totally Hip Software, 604/685-6525, \$100. Simple interface yields choppy results; adequate tool for no-frills animations. *Sep 97, p. 62*

★★★★ **wwwArt 2.0**, MicroFrontier, 515/270-8109, \$20. This simple, bargain-priced image editor excels at making Web graphics. *Nov 97, p. 107*

INTERNET/NETWORKING

★★★★½ **ActionLine 1.1**, Interactive Media, 415/948-0745, \$99. Beginners can add pizzazz to Web pages without Java programming. *Apr 97, p. 76*

★★★★½ **AppleShare IP 5.0**, Apple Computer, 408/996-1010, \$799 for five clients. Server software is a jack-of-all trades, faster than none. *Nov 97, p. 54*

★★★★½ **Apple VideoPhone Kit 1.5**, Apple Computer, 408/996-1010, \$279. Camera/software combo offers good, basic videoconferencing. *Aug 97, p. 56*

★★★★ **BeyondPress 3.0**, Astrobyte, 303/861-4861, \$495. QuarkXPress-to-Web XTension offers limited WYSIWYG Web authoring. *Nov 97, p. 69*

★★★★ **Bolero**, EveryWare Development, 905/819-1173, \$995 to \$4,995. Best tool for gathering demographics from your Web site; expensive. *Apr 97, p. 68*

★★★★½ **Claris Emailer 2.0**, Claris, 408/727-8227, \$49. E-mail innovator gets a face-lift and speed boost. *Jul 97, p. 52*

★★★★ **Claris Home Page 2.0**, Claris, 408/727-8227, \$99. Web authoring tool is great for building small to medium-size sites. *Aug 97, p. 104*

★★★★ **CometPage 1.0.5**, Digital Comet, 415/331-5551, \$149. Makes it easier to create dynamic Web pages—if you can work with HTML. *Jul 97, p. 70*

★★★★½ **Communicator 4.0**, Netscape Communications, 415/937-3777, \$59 (Standard Edition), \$79 (Professional Edition). Internet client packs more features into less RAM. *Oct 97, p. 49*

★★★★½ **CommuniGate 2.8**, Stalker Software, 415/383-7164, free (5 users) to \$600 (200 users). Fast and reliable multimedia messaging suite adds new

features. *Jun 97, p. 86*

★★★★ **CyberFinder 2.0**, Aladdin Systems, 408/761-6200, \$30. Unobtrusive, small, and incredibly stable URL manager. *Mar 97, p. 58*

★★★★½ **CyberGauge 2.0**, Neon Software, 510/283-9771, \$139 (two devices) to \$695 (20 devices). The only low-entry-cost, low-effort network-monitoring tool around. *Sep 97, p. 82*

★★★★½ **CyberPatrol 2.0**, Microsystems Software, 508/879-9000, \$30. Filtering device has several categories but updates aren't automatic. *Nov 97, p. 58*

★★★★ **CyberPress 1.0**, Extensis, 503/274-2020, \$149. QuarkXPress-to-HTML conversion on a budget. *Mar 97, p. 78*

★★★★½ **CyberStudio 1.0**, GoLive Systems, 415/463-1580, \$349. Excellent interface and precise controls; nearly perfect. *Aug 97, p. 104* **Editors' Choice** for best Web publishing tool for small-business sites.

★★★★ **Dave 1.0**, Thursby Software Systems, 817/478-5070, \$179. Painless Mac file sharing on Windows networks. *May 97, p. 72*

★★★★½ **DiltherBox 1.0**, RDG Tools, 650/344-2505, \$30. Keeps art files slim by automating a clever Webmasters' color trick. *Nov 97, p. 66*

★★★★ **DragNet 1.1.4**, OnBase Technology, 714/830-5682, \$40. While good for managing huge URL lists, software is a RAM hog. *Mar 97, p. 58*

★★★★½ **Enhanced CU-SeeMe 2.0**, White Pine Software, 408/446-1919, \$69. Good low-bandwidth videoconferencing, but unimpressive audio. *Aug 97, p. 56*

★★★★ **FileMaker Pro CGI**, Claris, 408/987-7000, free. Slow and inflexible FileMaker Pro Web publishing tool. *Apr 97, p. 114*

★★★★½ **FirstClass Intranet Server 1.0**, SoftArc, 905/415-7000, \$999 to \$2,723. Fine for messaging, but Intranet capabilities are second-rate. *Jan 98, p. 52*

★★★★½ **FrontPage 1.0**, Microsoft, 206/882-8080, \$149. Helpful automation, peculiar interface, exorbitant hardware demands. *Aug 97, p. 104*

★★★★ **Fusion 1.0**, NetObjects, 415/482-3200, \$695. Pixel-level control aids designers, but interface has glitches. *Aug 97, p. 104*

★★★★½ **Globetrotter Web Publisher 1.1.1**, Akimbo Systems, 510/843-6888, \$99. Intriguing automated functions, but murky design. *Aug 97, p. 104*

★★★★½ **HotMetal Pro 3.0**, SoftQuad, 416/544-9000, \$159. HTML tags and image previews provide little meaningful feedback. *Aug 97, p. 104*

★★★★½ **HTML Grinder 3.04**, Matterform Media, 505/983-4189, \$149. Tools automate site-management chores. *Mar 97, p. 76*

★★★★½ **HVS ColorGIF 2.0**, Digital Frontiers, 847/328-0880, \$99. Web color tool's significant power hidden behind a clunky interface. *Nov 97, p. 66*

★★★★½ **Insta.html 1.0**, Trailer Parc Technologies, 415/248-1350, \$179. Overpriced plug-in has trouble with FreeHand-to-Web conversion. *May 97, p. 82*

★★★★ **Internet Gateway 3.7.3**, Vicom Technology, 415/691-9520, \$249 to \$750. Network router software offers speedy Internet connections. *Jul 97, p. 70*

★★★★ **Lasso 1.1**, Blue World Communications, 206/313-1051, \$299. Lasso successfully ties FileMaker Pro databases to the Web. *Apr 97, p. 114* **Editors' Choice** for best Web database.

★★★★½ **Lasso Lite 1.0.6**, Blue World Communications, 206/313-1051, free. FileMaker Pro Web publishing tool is fast and free. *Apr 97, p. 114*

★★★★½ **LinkUPPP 1.1**, FCR Software, 617/494-1300, \$59. Smart log-in, detailed diagnostics, elegant interface make dial-up networking a snap. *Sep 97, p. 82*

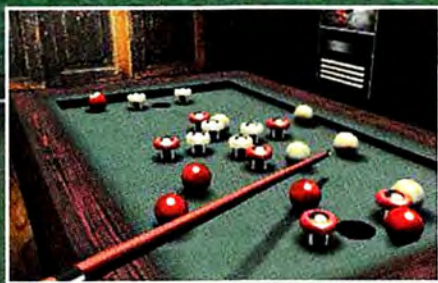
★★★★ **NetCenter Internet Station 1.0**, Dayna Communications, 801/269-7200, \$659. Slow, pricy Internet LAN access. *Jan 98, p. 62*

★★★★ **NetMinder 4.0.2**, Neon Software, 510/283-9771, \$795. Network analyzer makes monitoring

continues

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and problem diagnosis easy. *Aug 97, p. 78*

- ★★★★ **NetObjects Fusion 2.0**, NetObjects, 415/482-3200, \$695. Its expensive but it's still the best Web authoring tool. *Sep 97, p. 70*
- ★★★★½ **Network Administrator Toolkit 2.0**, Apple Computer, 408/996-1010, \$400 (10 users). Educator suite for administering LANs. *Jan 98, p. 54*
- ★★★★½ **Nodester**, Panimation, 407/599-9697, \$169. For creating single-node QuickTime VR movies, you can't beat Nodester. *Nov 97, p. 52*
- ★★★★ **PageCharmer 1.0**, Mainstay, 805/484-9400, \$140. Easily produces eye-catching effects with minimal space and speed requirements. *Oct 97, p. 68*
- ★★★★ **PageMill 2.0**, Adobe Systems, 408/536-6000, \$149. A straightforward approach with first-rate previewing capabilities. *Aug 97, p. 104*. **Editors' Choice** for best Web publishing tool for personal sites.
- ★★★★½ **PageSpinner 1.2.2**, Optima System, www.algonet.se/~optima/pagespinner.htm, \$25. Great tool for creating Web pages—especially for novice users. *Mar 97, p. 54*
- ★★★★½ **Phantom 2.0**, Maxum Development, 630/830-1113, \$395. Web crawler lets you build your own search pages. *Jul 97, p. 78*
- ★★★ **Presto Personal Page 2.5**, NewSoft, 510/445-8600, \$50. Modest features with average implementation, but easy to use. *Aug 97, p. 104*
- ★★★★½ **Quarterdeck Mail 4.0**, StarNine Technologies, 510/649-4949, \$395 server; \$245, five-user pack. Cost-effective, all-in-one e-mail solution. *Mar 97, p. 48*
- ★★★★½ **QuickMail Pro 1.0**, CE Software, 515/221-1801, \$70 to \$3,450. E-mail system has a good basic feature set. *Mar 97, p. 48*
- ★★ **QuickSite 1.0**, DeltaPoint, 408/648-4000, \$100. Automatically generates entire sites at a time, but feature set is tiny. *Aug 97, p. 104*
- ★★★★ **QuickTime VR Authoring Tools Suite 2.0**, Apple Computer, 408/996-1010, \$395. Suite is still difficult to use (and afford), but its feature set is unmatched. *Nov 97, p. 52*
- ★★★★ **RunShare 2.1**, RUN, 201/529-4600, \$399 (two users) to \$2,499 (25 users). AppleTalk network tool revs up file transfers by 250 to 400 percent. *Jun 97, p. 86*
- ★★★★½ **Shaman Update Server 1.1.6**, Shaman, 415/241-9952, \$595 per year; client \$25 per year. Good informational support for the software-updating process. *Oct 97, p. 62*
- ★★★★½ **Surfboard 1.0**, Abbott Systems, 914/747-3116, \$39. Intuitive URL manager looks like a TV's remote control. *Mar 97, p. 58*
- ★★★★½ **SurfWatch 3.0**, Spyglass Software, 415/948-9500, \$50. Automatic filter updates but an all-or-nothing block on IRC. *Nov 97, p. 58*
- ★★★★ **Tango for FileMaker Pro 2.1.1**, EveryWare Development, 905/819-1173, \$349. No faster way to Web-enable a FileMaker Pro database. *Apr 97, p. 114*. **Editors' Choice** for best Web database.
- ★★★★½ **Timbuktu Pro 4.0**, Netopia, 510/814-5000, \$199 (one user) to \$899 (ten users). With a raft of new features, Timbuktu is better than ever for remote access and control. *Jan 98, p. 56*
- ★★ **VideoPhone 2.01**, Connectix, 415/571-5100, \$99. May be a good solution for high-speed networks without existing bugs. *Aug 97, p. 56*
- ★★★★ **Visual Page 1.0**, Symantec, 541/334-6054, \$100. Resembles PageMill, but has less-convenient access to key features. *Aug 97, p. 104*
- ★★★★ **VivoActive Producer 2.0**, Vivo Software, 617/899-8900, \$695. Streaming video for smaller sites.

Nov 97, p. 70

- ★★★★ **Web-FM 3.0**, Web Broadcasting, 415/329-9676, \$245. FileMaker Pro Web integration tool is strong and fast but hard to learn. *Apr 97, p. 114*
- ★★★★½ **Web Quick 1.2.1**, Europa Software, 503/417-2900, \$50. Convenient URL manager follows your trail as you browse. *Mar 97, p. 58*
- ★★★★½ **Web Squirrel 1.06**, Eastgate Systems, 617/924-9044, \$49. RAM-hungry URL manager is a powerful organizer. *Mar 97, p. 58*
- ★★★★ **WebStar 2.0**, StarNine Technologies, 510/649-4949, \$795. Web server is better, stronger, faster. *Apr 97, p. 62*
- ★★ **WebWatcher 4.1.1**, Caravelle, 613/225-1172, \$295 to \$999. Web-site monitor doesn't live up to its name. *Aug 97, p. 72*
- ★★★★½ **World Wide Web Weaver 2.0.2**, Miracle Software, 315/265-0930, \$89. Web authoring tool is particularly good at editing existing pages. *Mar 97, p. 54*
- ★★★★½ **X-Stop 1.0**, Log-On Data, 714/577-4929, \$40. Reliable Internet filtering device lacks category filters but is inexpensive. *Nov 97, p. 58*

MEDIA

- ★★★★ **Audiotracer 1.0**, Optical Media, 408/376-3511, \$99. CD-R mastering program designed for creating audio CDs. *Apr 97, p. 76*
- ★★★★½ **Aurorix 2.0**, DigiEffects, 415/841-9901, \$289. From aged film to earthquakes, Aurorix's 26 usable effects are creatively designed. *May 97, p. 118*. **Editors' Choice** for best After Effects plug-ins.
- ★★★★½ **Berserk 1.3**, DigiEffects, 415/841-9901, \$289. This After Effects plug-in has great fog, blizzard, laser, and star-field effects. *May 97, p. 118*. **Editors' Choice** for best After Effects plug-ins.
- ★★★★ **Boris Effects 2.1 MP**, Artel Software, 617/451-9900, \$350 to \$695. Best Adobe Premiere and Media 100 plug-in; new version adds motion graphics, keying, and transition effects. *May 97, p. 118*. **Editors' Choice** for best Premiere and Media 100 plug-ins.
- ★★★★ **CameraMan 3.0**, Motion Works Group, 604/685-9975, \$70. A must-have for CD-ROM producers and interactive training. *Sep 97, p. 88*
- ★★ **Commotion 1.0.5**, Puffin Designs, 415/331-4560, \$2,495. Video-painting and -compositing application offers relief from the drudgery of frame-by-frame tweaking. *Jan 98, p. 44*
- ★★ **Cubasis AV 1.0**, Steinberg, 818/993-4161, \$149. Inexpensive program combines audio and MIDI recording. *Jan 98, p. 48*
- ★★★★ **Cumulus Desktop 3.0**, Canto Software, 415/905-0300, \$100. Affordable multimedia database offers power and a superior interface. *Jun 97, p. 68*
- ★★★★ **Cyclonist 1.0**, DigiEffects, 415/841-9901, \$495. This particle-generation specialist is a complex After Effects plug-in. *May 97, p. 118*
- ★★★★½ **Director 6 Multimedia Studio**, Macromedia, 415/252-2000, \$999. Bundle offers great value with enhanced authoring and great Web features. *Sep 97, p. 56*
- ★★★★½ **Dynamic Effects 1.0**, Gryphon Software, 619/536-8815, \$119. A solid but uninspiring filter plug-in collection for Adobe Premiere. *May 97, p. 118*
- ★★★★½ **Final Effects AP 1.0**, MetaCreations, 408/430-4100, \$199. Ideal for Adobe Premiere-based particle generation and distortion. *May 97, p. 118*
- ★★★★½ **HoloDozo 1.0**, M.M.M. Software, hologozo@mmmsoft.com, \$149. Novel Adobe Premiere plug-in has a clever interface, uses QuickDraw 3D. *May 97, p. 118*
- ★★½ **Illuminaire Paint 1.1**, Discreet Logic, 310/618-9700, \$1,995. Video-painting program is slow and unattractive, but it has promise. *Jan 98, p. 44*

- ★★★★½ **KPT Final Effects 3.0.1**, MetaCreations, 408/430-4100, \$695. This superb effects collection works with Adobe After Effects. *May 97, p. 118*
- ★★★★½ **Lens Flare Pack 1.5**, Knoll Software, 415/453-2471, \$129. This After Effects plug-in generates unmatched lens flare effects. *May 97, p. 118*. **Editors' Choice** for best After Effects plug-ins.
- ★★★★½ **LightWave 3D 5.0**, NewTek, 303/448-9700, \$1,495. Pro-level animation program lacks interface elegance. *May 97, p. 74*
- ★★★★½ **Media Cleaner Pro 2.0**, Terran Interactive, 408/278-9025, \$359. Innovative video-compression utility is a must for quality-obsessed moviemakers. *Oct 97, p. 66*
- ★★ **MovieTools 1.5**, McQ Productions, 415/348-1344, \$195. Simple, precise QuickTime movie processing. *Apr 97, p. 72*
- ★★★★ **PhotoVista**, Live Picture, 408/438-9610, \$129. Stitching software lets you create panoramas in both QuickTime VR and RealSpace formats. *Nov 97, p. 52*
- ★★★★½ **Portfolio 1.5**, Extensis, 503/274-2020, \$100. Multimedia database, once named Fetch, has cool features but lacks flexibility and ease of use. *Jun 97, p. 68*
- ★★★★½ **SmartSound for Multimedia 1.6**, Sonic Desktop Software, 818/718-9993, \$200. Multimedia utility creates precisely timed soundtracks. *Oct 97, p. 70*
- ★★½ **Spin Panorama 1.0**, PictureWorks, 510/855-2001, \$100. Inexpensive QuickTime VR stitching tool is good for casual linkering on slower Macs, but not for serious VR work. *Nov 97, p. 52*
- ★★★★½ **Studio Effects 1.0**, MetaCreations, 408/430-4100, \$695. Adobe After Effects plug-ins include 3-D particle generator and great spotlight effects. *May 97, p. 118*
- ★★★★ **SuperCard 3.0**, Allegiant Technologies, 619/587-0500, \$329. Veteran authoring tool gets a cool Web plug-in; a few Web-related bugs. *May 97, p. 58*
- ★★½ **TransFX 1.0**, DigiEffects, 415/841-9901, \$45. Inexpensive and fun transition collection for Adobe Premiere. *May 97, p. 118*
- ★★★★ **TypeCaster 2.0**, Xaos Tools, 415/538-7000, \$199. 3-D text plug-in renders beautiful text that you can animate. *May 97, p. 118*
- ★★½ **Ultimate for Macintosh 2.0**, Ultimatte, 818/993-8007, \$1,495. Complex, costly plug-in does an unmatched job of keying. *May 97, p. 118*
- ★★★★½ **Video SpiceRack 1.0**, Pixélan Software, 360/647-0112, \$179. Novel plug-in collection has more than 300 transition and effect gradients. *May 97, p. 118*

PROGRAMMING

- ★★★★ **CodeWarrior Professional 1.0**, Metrowerks, 512/873-4700, \$599 (\$119 education sites). Ideal for developers who need Java, and won't faint at updating code. *Oct 97, p. 64*
- ★★½ **MacA&D 6.0**, Excel Software, 515/752-5359, \$1,995. A first-rate, real-world collection of CASE tools, but it needs an update. *Sep 97, p. 84*
- ★★★★ **Omnis Studio**, Omnis Software, 415/571-0222, \$1,599. Build databases that connect mainframe SQL data to Web browsers. *Nov 97, p. 72*
- ★★★★ **Pro Fortran 5.0**, Absoft, 810/853-0050, \$899. Formidable compiler suite has faster compiled programs and a better debugger. *Jul 97, p. 80*
- ★★★★ **Roaster Release 3**, Roaster Technologies, 617/876-4031, \$99. A "nondeveloper" version of the most powerful Java tool for the Mac. *Sep 97, p. 80*
- ★★★★ **Scripter 2.0**, Main Event Software, 202/298-9595, \$199. General scripting tool to make CGI work on a Mac-based Web site. *Apr 97, p. 74*
- ★★★★ **Vibe Enterprise 1.0.1**, Visix Software, 703/758-8230, \$1,995. High-end Java development environment.

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ment for serious database work. *Jan 98, p. 58*

- Visual Café 1.0, Symantec, 541/334-6054, \$200. Faster, easier Java coding, great for creating applets from scratch. *May 97, p. 67*

PUBLISHING

- Acrobat 3.0, Adobe Systems, 408/536-6000, \$295 to \$1,595. New features still limit use of this portable-document program. *Apr 97, p. 52*
- Common Ground 3.0.1, Hummingbird Communications, 415/917-7300, \$195. Portable-document program can't match Adobe Acrobat. *Jul 97, p. 72*
- Image Alchemy PS 2.1.4, Handmade Software, 510/252-0101, \$495. An expensive—and unreliable—solution to service-bureau crises. *Jul 97, p. 60*
- PageMaker 6.5, Adobe Systems, 408/536-6000, \$895. Even with a wealth of new features, still can't beat QuarkXPress. *May 97, p. 48*
- Preflight Pro 1.0, Extensis, 503/274-2020, \$400. Bulletproof your QuarkXPress files before printing. *Nov 97, p. 74*
- QX-Tools 2.0, Extensis, 503/274-2020, \$100. Winning collection of XTensions gets even better. *Mar 97, p. 65*
- UniQom 1.2, SoftPress Systems, 415/331-4820, \$895. Easily turns print into Java-powered Web pages; features still a bit sluggish. *Apr 97, p. 58*

UTILITIES

- Adobe Type Manager Deluxe 4.0, Adobe Systems, 408/536-6000, \$100. New font manager module proves you can teach an old dog new tricks. *Sep 97, p. 130. Editors' Choice* for best utilities.
- Adobe Type Reunion Deluxe 2.0, Adobe Systems, 408/536-6000, \$60. Organizes fonts; lets you rename fonts or display them in their own typeface. *Sep 97, p. 130. Editors' Choice* for best utilities.
- AliasDragger 1.0b1, Leonard Rosenthal, free. One-note freebie makes alias creation a snap. *Sep 97, p. 130. Editors' Choice* for best utilities.
- BigThesaurus 2.1, Deneba Software, 305/596-5644, \$30. Most complete, easiest-to-use electronic thesaurus around. *Sep 97, p. 130. Editors' Choice* for best utilities.
- Bookends Plus 4.0, Westing Software, 415/945-3870, \$129. Reference manager adds powerful Web functions. *Jul 97, p. 76*
- Burn It 1.0, Synchrony Softcorp, 213/340-4100, \$30. Inexpensive but flawed security suite. *Apr 97, p. 69*
- CD Speedster, Synchrony Softcorp, 213/340-4100, \$30. Provides modest CD acceleration, but only in limited cases. *Jul 97, p. 58*
- Conflict Catcher 4.0.2 (4.0.3), Casady & Greene, 408/484-9228, \$100. Nearly perfect, and virtually essential, start-up document manager. *Sep 97, p. 130. Editors' Choice* for best utilities.
- DeltaVideo 1.1, Channel D, 732/933-9388, \$99. Motion-tracking and -analysis software marred by a confusing interface and stability. *Jan 98, p. 43*
- DigitalRadar 1.0, Connectix, 415/571-5100, \$30. Motion-detection software succeeds as slickly executed amusement. *Jan 98, p. 43*
- DiskExpress II 2.21, Alsoft, 281/353-4090, \$90. Intelligently defragments hard drives. *Sep 97, p. 130. Editors' Choice* for best utilities.
- DragStrip 2.0.1, Natural Intelligence, 617/876-4876, \$60. Versatile, feature-packed file launcher well worth the premium price. *Sep 97, p. 130. Edi-*

tors' Choice for best utilities.

- d-Time, Acceleration Software, 206/224-3727, \$60. This CD-ROM accelerator is disappointing across the board. *Jul 97, p. 58*
- FlashBack 1.0, Aladdin Systems, 408/761-6200, \$70. File utility tracks and restores previous versions, but it may be easier to do it yourself. *Jan 98, p. 60*
- Font Box 2.1, Insider Software, 619/622-9900, \$30 (Personal Edition) to \$170 (Network Edition). Font organizer is helpful, but not a panacea. *Aug 97, p. 74*
- Insider Updates 1.01, Insider Software, 619/622-9900, \$84 per year. Great if you need up-to-the-minute software costs \$7 a month. *Oct 97, p. 62*
- Internet Voice Mail 3.0, VocalTec, 201/768-9400, \$30. Limited functionality and full of bugs. *May 97, p. 80*
- KeyQuencer 2.1, Binary Software, 310/449-1481, \$40. Upgrade adds Internet controls, kills bugs; still requires programming. *Sep 97, p. 76*
- MAE 3.0, Apple Computer, 408/996-1010, \$459. Mac-in-the-box for Unix workstations. *Jun 97, p. 73*
- Private File 2.0, Aladdin Systems, 408/761-6200, \$100. An adequate, simple encryption utility—but PGP offers better value. *Jan 98, p. 58*
- QuickKeys 3.5.2, CE Software, 515/224-1995, \$119. Best compromise between power and ease of use. *Sep 97, p. 130. Editors' Choice* for best utilities.
- RAM Doubler 2.0.1 (2.0.2), Connectix, 415/571-5100, \$99. As much as triples your RAM. *Sep 97, p. 130. Editors' Choice* for best utilities.
- Retrospect 4.0, Dantz Development, 510/253-3000, \$249; ten-client pack, \$299; Network Backup Kit (Retrospect plus ten clients), \$499. IP support for both platforms is an indispensable tool. *Oct 97, p. 48*
- ScrapItPro 5.33, John V. Holder, www.northcoast.com/~jholder, \$20. Edit text, copy part of an image, and find items by title or contents. *Sep 97, p. 130. Editors' Choice* for best utilities.
- SoftWindows 95 4.0, Insignia Solutions, 408/327-6000, \$379. Faster than before, but still no match for hardware solutions (or a PC). *Jul 97, p. 54*
- SpeechPrompter, Orator Company, 619/420-9150, \$90. Prompter software's jerky scrolling makes index cards look good. *Jun 97, p. 88*
- Speed Doubler 2.0.1, Connectix, 415/571-5100, \$99. Upgrade boosts network transfer times, same speed as prior versions. *May 97, p. 52*
- StuffIt Deluxe 4, Aladdin Systems, 408/761-6200, \$130. If you got it off the Internet, StuffIt can almost certainly decompress it for you. *Sep 97, p. 130. Editors' Choice* for best utilities.
- StyleScript 3.5, Infowave, 604/473-3600, \$149. PostScript solution works for some ink-jets. *Aug 97, p. 67*
- System Sculptor 2.01, Colourfull Creations, 810/749-3013, \$30. Bare-bones utility for managing extensions. *Aug 97, p. 72*
- Tailor 2.0, EnFocus Software, 303/393-7282, \$369. A weak interface and unreliable performance hinder its troubleshooting talents. *Jul 97, p. 60*
- TalentPrompter, John Stanley Training Programs, 408/374-1235, \$95. Bare-bones prompter does the job. *Oct 97, p. 70*
- Tex-Edit Plus 2.0.1, Tom Bender, members.aol.com/tomb, \$10. Cleans up messy, downloaded text files effortlessly. *Sep 97, p. 130*
- Turbo Toolkit 1.0, FWB Software, 415/463-3500, \$79. Disk utility offers minor speedup. *Mar 97, p. 74*
- Typelt4Me 4.7, Riccardo Ettore, 72277.1344@compuserve.com, \$30. Automatically expands user-defined abbreviations. *Sep 97, p. 130*
- TypeTamer 1.1.8, Impossibile Software, 714/470-4800, \$60. Groups fonts in the Font menu into fam-

ilies and user-defined sets. *Sep 97, p. 130*

- Virex 5.7, Datawatch, 508/988-9700, \$99. Great virus-detection features, checks downloaded Internet files for viruses. *May 97, p. 78*
- Virtual PC 1.0, Connectix, 415/571-5100, \$149. Slow-but-steady emulator—at a lower price than SoftWindows 95. *Sep 97, p. 58*

Hardware

DIGITAL CAMERAS

- Casio QV-10A, Casio, 201/361-5400, \$399. Blown highlights and color cast problems mar images from camera. *Mar 97, p. 112*
- Casio QV-100, Casio, 201/361-5400, \$599. Camera produces poor-quality images with blown highlights. *Mar 97, p. 112*
- D-200L, Olympus, 516/844-5000, \$599. Images with crisp detail and good exposure, but you can't upgrade the image capacity. *Nov 97, p. 89*
- D-300L, Olympus America, 516/844-5000, \$899. Low-cost, great picture quality. *Jul 97, p. 48*
- DC20, Eastman Kodak, 716/724-4000, \$199. Low-cost camera's acceptable image exposure is offset by JPEG artifacts and dull colors. *Nov 97, p. 89*
- DC25, Eastman Kodak, 716/724-4000, \$399. Distracting color casts and JPEG artifacts add up to poor image quality. *Nov 97, p. 89*
- DC50, Kodak, 716/724-4000, \$979. Good color, expandability, and an excellent zoom lens set the DC50 apart. *Mar 97, p. 112. Editors' Choice* for best entry-level digital cameras.
- DC120 Zoom, Kodak, 716/724-4000, \$999. Without a fix to its corruption problem, we can't recommend the DC120. *Oct 97, p. 44*
- Dimage V, Minolta, 201/825-4000, \$895. Odd design, grainy LCD, and a proprietary image format hobble this unit. *Oct 97, p. 44*
- DS-7, Fuji Photo Film, 914/789-8100, \$599. Accurate color and good overall image exposure, although images may be blurry. *Nov 97, p. 89*
- DSC-F1, Sony Electronics, 408/432-0190, \$849. Fun-to-use camera lacks removable storage—close second to the QuickTake 200. *Jul 97, p. 48*
- ePhoto 307, Agfa, 201/440-0111, \$299. Images are surprisingly good despite blown-out highlights and slight color shift. *Nov 97, p. 89*
- Fuji DS-7, Fuji Photo Film, 914/789-8100, \$699. Camera makes framing and reviewing photographs child's play. *Mar 97, p. 112. Editors' Choice* for best entry-level digital cameras.
- MP-EG1A, Hitachi Home Electronics, 770/279-5600, \$2,700 (includes SCSI interface kit). Most readers should wait. *Jan 98, p. 46*
- PDC-2000-40, Polaroid, 716/256-4436, \$3,695. Difficult to use and not inexpensive, but produces extremely high-quality images. *Mar 97, p. 112. Editors' Choice* for best entry-level digital cameras.
- PhotoPC, Epson, 310/782-0770, \$499. Viewfinder doesn't show the whole image. *Mar 97, p. 112*
- PhotoPC 500, Epson, 310/782-0770, \$499. Offers crisp image detail and features similar to those of the Agfa ePhoto 307, but costs more. *Nov 97, p. 89*
- Q-EZ, Konica, 201/568-3100, \$399. Expect reasonably good color and blurry details from this bulky low-cost digital camera; it also lacks an LCD. *Nov 97, p. 89*
- Q-mini, Konica, 201/568-3100, \$599. This pint-size digital camera offers fairly accurate hues but disappointingly hazy images. *Nov 97, p. 89*

continues

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Circle 29 on reader service card

Mouse Ratings

- QuickTake 200, Apple Computer, 408/996-1010, \$599. Accurate, well-exposed color, although its images will need some sharpening. *Nov 97, p. 89*
- QV-10A, Casio, 201/361-5400, \$399. Images have numerous problems, including artifacts, stark contrast, and low resolution. *Nov 97, p. 89*
- QV-100, Casio, 201/361-5400, \$599. JPEG artifacts; poor color and exposure. *Nov 97, p. 89*
- RDC-2, Ricoh, 702/352-1600, \$999. Fair-to-mid-dling image quality detracts from camera's extras. *Mar 97, p. 112*
- VE-LC1, Sharp, 201/529-8200, \$799. Compact, handsome, and easy to use, but lacks a zoom lens and flash. *Oct 97, p. 44*

INPUT DEVICES

- AlphaSmart Pro 2.1, Intelligent Peripheral Devices, 408/252-9400, \$269. Intelligent keyboard works as stand-alone input device. *Mar 97, p. 82*
- F-16 Fighterstick, CH Products, 760/598-2518, \$120. Solid-feeling and responsive controller delivers hands-on control. *Jan 98, p. 80*
- GlidePoint Keyboard, Alps Electric, 408/432-6000, \$140. Keyboard offers full set of keys with intuitive touchpad. *Apr 97, p. 60*
- NoHands Mouse, Hunter Digital, 310/471-5852, \$200. Foot-operated mouse offers a hands-free alternative. *Jun 97, p. 83*
- Orbit Trackball, Kensington, 415/572-2700, \$70. A well-designed, attractive mouse alternative. *Aug 97, p. 70*
- Pro Throttle, CH Products, 760/598-2518, \$100. Loads of buttons and switches add to the precision of this controller. *Jan 98, p. 80*
- TrackBoard and NumPad, Datadesk, 206/842-5480, \$140 (TrackBoard available separately for \$100). Keyboard has a separate numeric keypad but only a small trackball. *Apr 97, p. 60*

MISCELLANEOUS HARDWARE

- ADB I/O, BeeHive Technologies, 818/304-0664, \$199. Hardware add-on lets you achieve total control of your home appliances. *Sep 97, p. 86*
- CD Stomper, Stomp, 714/250-6771, \$80. Of the two labeling kits tested, CD Stomper is clearly the better product. *Aug 97, p. 60*
- DynaTek CDM 4001, DynaTek Automation Systems, 902/832-3000, \$2,889. Hard drive/CD-R combo simplifies CD-ROM mastering. *Mar 97, p. 78*
- eMate 300, Apple Computer, 408/996-1010, \$799. Integrated portable for students proves Newton technology can work. *Aug 97, p. 62*
- FM Radio 1.1, La Cie, 503/520-9000, \$50. To listen to the radio buy a boom box. *Jun 97, p. 90*
- MessagePad 2000, Apple Computer, 408/996-1010, \$949. Nifty Newton a natural for the Mac. *Aug 97, p. 136*
- Neato CD Labeler Kit, Neato, 203/466-5170, \$80. Neato can't hold a candle to the CD Stomper. *Aug 97, p. 60*
- PalmPilot Accessories, 3Com, 408/848-5604, \$30 to \$100. Wallet and stylus replacements for the popular PDA make stylish gifts. *Jan 98, p. 98*
- PalmPilot Personal, 3Com, 847/676-1441, \$299. Fast, inexpensive, battery-stingy, 6-ounce marvel. *Sep 97, p. 136*
- PowerKey Pro 600, Sophisticated Circuits, 206/485-7979, \$199. A power strip for gadget freaks. *Sep 97, p. 87*

- Psion Series 3c, Psion, 508/371-0310, \$549. PDA veteran with poor Mac connectivity. *Aug 97, p. 136*
- WebTV Internet Terminal, Sony, 888/772-7669, \$350; \$80 for keyboard. Expensive, easy-to-use device has nice interface. *May 97, p. 64*
- Zaurus ZR-5800FX, Sharp Electronics, 201/529-8200, \$599. Businesslike but crude handheld device. *Aug 97, p. 136*

MODEMS/NETWORKS

- 4-Sight Fax 4.0, 4-Sight Technologies, 515/221-3000, \$795 (ten users). Flexible, reliable faxing on your network. *Apr 97, p. 57*
- Courier V.Everything 56K, U.S. Robotics, 847/982-5010, \$395. Some setup hassles with 56K. *Jul 97, p. 67*
- DataShuttle 256, RNS, 805/968-4262, \$1,395. Card allows superfast, two-line ISDN file transfers. *Jun 97, p. 75*
- InterJet, Whistle Communications, 415/577-7000, \$1,995 to \$2,395. All-in-one combo gets your office on the Web. *Jun 97, p. 60*
- MultiModem2DXV, Multi-Tech Systems, 612/785-3500, \$269. Expensive average-performing 33.6-Kbps modem, with no Macintosh software. *Apr 97, p. 123*
- MV.34MA, Boca Research, 561/997-6227, \$236. Offers fast, easy Internet hookup. *Apr 97, p. 123*
- QuickStream Pro, Sonic Systems, 408/736-1900, \$999. Remote-access server eases telecommuting access. *Jul 97, p. 80*
- Quicktel II-C 33X-ASP-C-M, Logiccode Technology, 805/383-2500, \$319. Fast 33.6-Kbps with innovative design, but a bit pricey. *Apr 97, p. 123*
- SmartLink 3334AV, Archtek America, 818/912-9800, \$209. Poorly performing, affordable 33.6-Kbps. *Apr 97, p. 123*
- SmartOne 336FLXMac, Best Data Products, 818/773-9600, \$179. Inexpensive 33.6-Kbps is one of the slowest. *Apr 97, p. 123*
- Sportster 28.8/33.6 Faxmodem, U.S. Robotics, 847/676-7010, \$179. Affordable 33.6-Kbps offers best performance. *Apr 97, p. 123* **Editors' Choice** for best 33.6-Kbps fax modem.
- SupraSonic 336V+, Diamond Multimedia Systems, 360/604-1400, \$249. Full-featured 33.6-Kbps isn't cheap but is really fast. *Apr 97, p. 123*
- TelePort Internet Edition 33.6, Global Village Communication, 408/523-1000, \$169. Fast 33.6-Kbps has flash ROM and CCL scripts. *Apr 97, p. 123*
- WebRamp M3, Ramp Networks, 408/988-5353, \$439. Multiple-modem router offers a slow, expensive alternative to ISDN. *Oct 97, p. 68*
- Zoom V.34X Plus, Zoom Telephonics, 617/423-1072, \$199. Average-performing 33.6-Kbps modem with a long, seven-year warranty. *Apr 97, p. 123*

PRINTERS

- BJC-4550, Canon Computer Systems, 714/438-3000, \$499. Slow with grainy output, but is the only tabloid-size printer at this price. *Nov 97, p. 115*
- Color LaserWriter 12/660 PS, Apple Computer, 408/996-1010, \$6,100. Lower price and more RAM than its predecessor, but still middle of the pack. *Jun 97, p. 56*
- Color StyleWriter 4100, Apple Computer, 408/996-1010, \$240. Expect mediocre output and speed from this low-cost color printer. It offers no PhotoGrade option. *Nov 97, p. 115*
- Color StyleWriter 4500, Apple Computer, 408/996-1010, \$340. You'll get vivid colors and improved text printing from this low-cost printer, as well as crude color transitions and

- grainy output. *Nov 97, p. 115*
- Color StyleWriter 6500, Apple Computer, 408/996-1010, \$470. Apple's best low-cost color printer produces decent photo output when you use PhotoGrade ink, otherwise output is washed-out and grainy. *Nov 97, p. 115*
- DeskJet 870Cse, Hewlett-Packard, 408/246-4300, \$599. Color ink-jet printer offers good speed and image quality. *Jun 97, p. 125*
- DeskJet 870se, Hewlett-Packard, 408/571-2304, \$399. This low-cost printer is fast and dependable if you're printing black text, but its image output is grainy with poor color reproduction. *Nov 97, p. 115*
- DocuPrint C55mp, Xerox, 716/423-3413, \$3,500. Color laser printer is almost as appealing as the Tektronix Phaser 560. *Oct 97, p. 42*
- FotoFun Digital Color Photo Printer, Fargo Electronics, 612/941-9470, \$599. Color photo printer has sharp output with intense color saturation but a tad noisy. *Nov 97, p. 62*
- LaserJet 5M, Hewlett-Packard, 408/246-4300, \$2,229. Laser printer is easily upgraded and offers top-notch software. *Jun 97, p. 125*
- LaserJet 6MP, Hewlett-Packard, 408/246-4300, \$1,149. Laser printer offers middling performance and excellent software. *Jun 97, p. 125*
- LaserWriter 12/640 PS, Apple Computer, 408/996-1010, \$1,599. Laser printer has good speed and image quality for the price. *Jun 97, p. 125*
- Masterpiece MD-2300, Alps Electric USA, 408/432-6000, \$970. Stellar photographic output, but dismal speed. *Oct 97, p. 52*
- MD-1000, Alps Electric USA, 408/432-6000, \$399. Slow, low-cost color printer produces washed-out, lifeless colors and poor plain-paper output. *Nov 97, p. 115*
- NC-2 Digital/Video Printer, Fujifilm, 914/789-8100, \$699. Photo printer captures and prints TV shots but images have a faint magenta tint. *Nov 97, p. 62*
- Network Color Printer, IBM, 404/238-1234, \$8,999. Its speed and output won't disappoint you, but it's not a good deal. *Jun 97, p. 56*
- Optra SC 1275n, Lexmark, 606/232-2000, \$4,999. Oversaturated output lacks detail, but print speed can't be beat. *Oct 97, p. 42*
- Personal LaserWriter 4/600 PS, Apple Computer, 408/996-1010, \$899. This expensive laser printer is slow and has nonstandard memory. *Jun 97, p. 125*
- Phaser 560, Tektronix, 503/682-7377, \$5,495. Bulky, boxy, and a little slow—but still the clear winner in color lasers. *Oct 97, p. 42*
- PrimerA Pro Elite, Fargo Electronics, 612/941-9470, \$2,195. Printer still fails to make the grade due to significant output problems. *Jan 98, p. 56*
- Signature CD Color Printer, Fargo, 612/941-9470, \$1,295. If you produce a lot of CDs, this printer is a good investment. *Aug 97, p. 60*
- Stylus Color 600, Epson America, 310/782-0770, \$299. You'll get great output at an excellent price from this low-cost color printer, but it is a bit slow and doesn't support an Ethernet upgrade. *Nov 97, p. 115*
- Stylus Color 800, Epson America, 310/782-0770, \$449. Fine resolution, rich colors, and a speedy print engine make this a great all-purpose printer. *Nov 97, p. 115*
- Stylus Photo, Epson America, 310/782-0770, \$499. This low-cost color printer produces smooth color transitions even on plain paper and offers the best photo-quality output available at this price. *Nov 97, p. 115*
- SuperScript 1260N, NEC Technologies, 508/742-8000, \$1,079. This speedy and inexpensive printer lacks PostScript, but you would never

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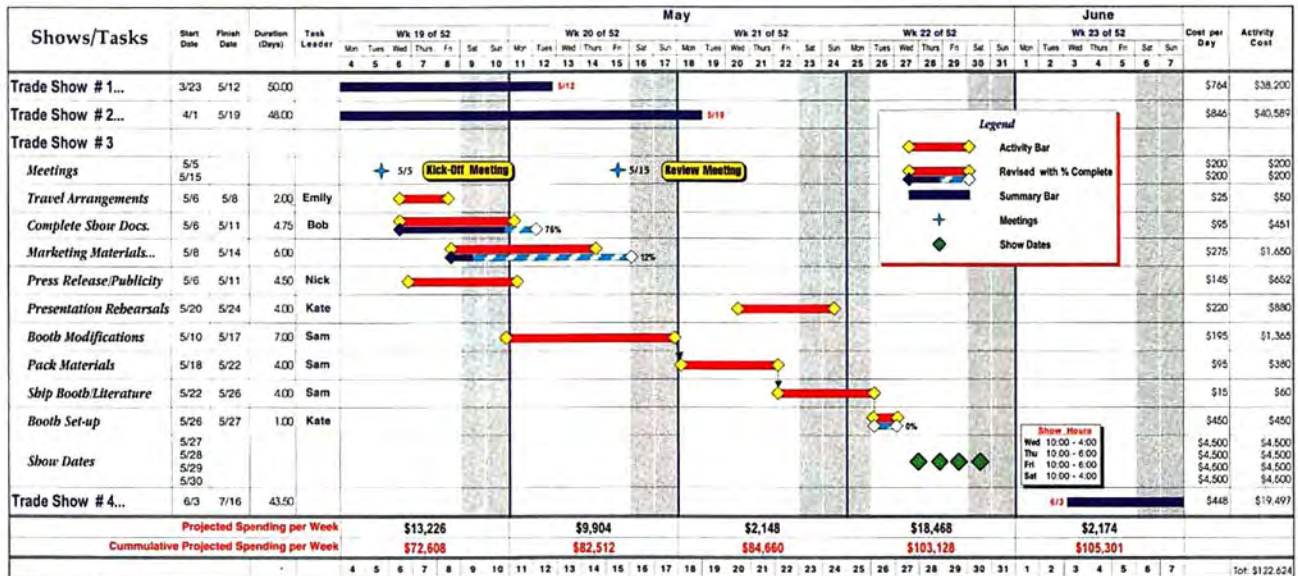
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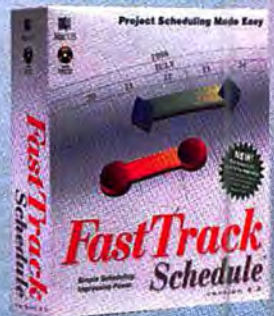
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Mouse Ratings

know it. Oct 97, p. 50

- ★★½ **TruPhoto Printer**, Panasonic Interactive Media, 408/653-1888, \$399. Color photo printer produces average-quality prints, but it's pokey. Nov 97, p. 62

SCANNERS

- ★★ **ArtiScan Z1-600**, Tamarack Technologies, 714/744-3979, \$499. Slow, unimpressive machine makes a rumbling noise while scanning. Mar 97, p. 131
- ★★ **ArtiScan Z1-1200**, Tamarack Technologies, 714/744-3979, \$699. Slow, unimpressive, noisy scanner can scan at 600 dpi and 30-bit. Mar 97, p. 131
- ★★★★ **Astra 600S**, Umax, 510/651-4000, \$299. Great price and color fidelity make this our top pick. Nov 97, p. 99
- ★★★★ **Astra 1200S**, Umax, 510/651-4000, \$549. Automated color correction, top speed, and sharpness marred by relatively high price. Nov 97, p. 99
- ★★½ **Color OneScanner 600/27**, Apple Computer, 408/996-1010, \$629. Very fast, user-friendly scanner gets great results but at a high price. Nov 97, p. 99
- ★★★★ **Color PageWiz**, Microtek Lab, 310/297-5000, \$159. Super-low-priced sheetfed scanner offers color, advanced OCR. Sep 97, p. 64
- ★★½ **CS-600 Scanner**, Polaroid, 617/386-2000, \$1,495. This midrange scanner offers unimpressive performance and software, combined with a high price. Dec 97, p. 105
- ★★★★½ **Expression 636 Professional**, Epson America, 310/782-0770, \$1,399. Great scans, software, and performance, in addition to a low price, make this midrange scanner an easy choice. Dec 97, p. 105
- ★★ **ImageReader Elite**, Info, 408/538-2500, \$399. Small, inexpensive scanner delivers mediocre performance. Mar 97, p. 131
- ★★ **ImageReader FB**, Info, 408/538-2500, \$549. Painfully slow scanner with anemic software and awkward case design. Mar 97, p. 131
- ★★½ **Linocolor Saphir**, Linotype-Hell, 516/434-2000, \$1,849. A convoluted interface and high price are detrimental to this otherwise high-quality midrange scanner. Dec 97, p. 105
- ★★★★ **MCA S600C**, Mitsubishi Chemical America, 408/954-8484, \$299. Document scanning gets colored. Jun 97, p. 78
- ★★★★ **PaperPort Strobe**, Visioneer, 510/608-0300, \$299. Fast color page scanner combines convenient size and great software. Sep 97, p. 64
- ★★★★ **PowerLook II**, Umax, 510/651-4000, \$1,895. A darned good scanner that offers fine detail resolution and great bundled software, but is a bit pricey. Dec 97, p. 105
- ★★ **ScanAce II**, Pacific Image Electronics, 310/214-5281, \$399. Inexpensive scanner offers unexceptional scan quality, weak software, and middling speed. Nov 97, p. 99
- ★★½ **ScanAce III**, Pacific Image Electronics, 310/214-5281, \$1,199. This inexpensive midrange scanner offers unexceptional scan quality, weak software, and middling speed. Dec 97, p. 105
- ★★½ **ScanJet 4P**, Hewlett-Packard, 208/323-2551, \$615. Outstanding color fidelity, but large, heavy scanner has weak software. Mar 97, p. 131
- ★★ **ScanJet 5p**, Hewlett-Packard, 415/857-1501, \$530. Inaccurate color and feature-starved software make this scanner inappropriate for anyone who wants to go past one-button scanning. Nov 97, p. 99
- ★★ **ScanMaker III**, Microtek Lab, 310/297-5000, \$1,499. This midrange scanner's easy-to-use soft-

ware and reasonable price are counterbalanced by slow performance and unexceptional color accuracy and sharpness. Dec 97, p. 105

- ★★ **ScanMaker E3**, Microtek Lab, 310/297-5000, \$329. Inexpensive, but disappointing speed, color, and gray-scale test results. Mar 97, p. 131
- ★★ **ScanMaker E6**, Microtek Lab, 310/297-5000, \$299. Easy-to-use scanning software and a good color-calibration program, at a reasonable price. Nov 97, p. 99
- ★★½ **ScanMaker V300**, Microtek Lab, 310/297-5000, \$149. Adept at image capture, this scanner suffers from color casts. Nov 97, p. 99
- ★★ **ScanTouch 110**, Nikon Electronic Imaging, 516/547-4355, \$299. A relatively fast scanner, with good color fidelity and an attractive price. Mar 97, p. 131
- ★★ **ScanTouch 210**, Nikon Electronic Imaging, 516/547-4355, \$699. Slower and more expensive than the ScanTouch 110, but 600 dpi. Mar 97, p. 131
- ★★½ **SilverScanner IV Prepress**, La Cie, 503/844-4500, \$1,099. This scanner offers good color accuracy and fast previews, but it's weak on features and has a confusing interface. Dec 97, p. 105
- ★★½ **SilverScanner Pro**, La Cie, 503/844-4500, \$349. This scanner's dim colors and poor detail were only made worse by the confusing, feature-weak software. Nov 97, p. 99
- ★★½ **SnapScan**, Agfa, 508/658-5600, \$299. Fast, inexpensive scanner offers sharp detail and comes with great software. Nov 97, p. 99

STORAGE

- ★★★★ **1.0GB Jaz**, Club Mac, 714/768-8130, \$499. Speedy third-party Jaz drive is hobbled by poor manual and missing refinements. Aug 97, p. 115
- ★★½ **1.0GB Jaz D2/Stol**, La Cie, 503/520-9000, \$469. Third-party Jaz drive crawls at barely half the

speed of Iomega's own. Aug 97, p. 115

- ★★½ **2.6GB Optical**, ClubMac, 714/768-8130, \$1,699. Optical drive offers middle-of-the-road price, performance, and features. Aug 97, p. 115
- ★★½ **540MB MCD D2/Stol**, La Cie, 503/520-9000, \$249. Slowest mid-capacity removable hard drive is no match for the APS M540. Aug 97, p. 115
- ★★ **640MB MO D2/Stol**, La Cie, 503/520-9000, \$499. Poorest-performing medium-capacity optical drive is not a good buy. Aug 97, p. 115
- ★★½ **640se**, Maxoptix, 510/353-9700, \$685. Comparably priced and almost as speedy as the APS 640 MO, this drive is a reasonable choice. Aug 97, p. 115
- ★★½ **Apex 4.6GB**, Pinnacle Micro, 714/789-3000, \$1,695. Space-age case fails to make up for surprisingly poor performance. Aug 97, p. 115
- ★★ **APS 230 MO**, APS Technologies, 816/483-1600, \$380. Optical drive performs better than the Sys.230/SCSI, but it's no bargain. Aug 97, p. 115
- ★★½ **APS 640 MO**, APS Technologies, 816/483-1600, \$600. Best-performing medium-capacity optical drive is a good buy. Aug 97, p. 115
- ★★★★½ **APS Jaz**, APS Technologies, 816/483-1600, \$500. This third-party Jaz drive comes close to matching Iomega's. Aug 97, p. 115. **Editors' Choice** for best removable hard drive.
- ★★★★ **APS M540**, APS Technologies, 816/483-1600, \$300. Top-performing mid-capacity removable is ideal for budget watchers. Aug 97, p. 115
- ★★ **APS Q3200**, APS Technologies, 816/483-1600, \$400 to \$480. At 5400 rpm, this 3GB hard drive is not fast, but it is nicely priced. May 97, p. 127
- ★★½ **Barracuda 4LP**, Club Mac, 714/768-8130, \$789 to \$849. An ordinary-looking case masks a 7200-rpm, 2GB drive that screams. May 97, p. 127
- ★★½ **CDE260R**, DynaTek Automation Systems, 902/832-3000, \$699. CD-Rewritable drive's lack of back-

continues

Jan once spent all day making "Effective Time Management" training manuals. Ironic, isn't it?



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Mouse Ratings

ward compatibility is its undoing. Oct 97, p. 54

- ★★ D2, La Cie, 503/520-9000, \$399. 2GB hard drive with some thoughtful touches is average speed. May 97, p. 127
- ★★½ DCS 2150, Direct Connections, 612/937-6283, \$825. 2GB drive is a speed demon, whether connected internally or externally. May 97, p. 127
- ★★ DisKovery, Optima Technology, 714/476-0515, \$560. 2GB hard drive is an easy all-in-one solution. May 97, p. 127
- ★★ DynaMO 640, Fujitsu, 408/432-6333, \$499. Second-place speed for a medium-capacity MO and few amenities. Aug 97, p. 115
- ★★½ EZFlyer 230, SyQuest, 510/226-4000, \$199. The Zip's nearest competitor has modest performance at a low price. Aug 97, p. 115
- ★★ Fireball TM 21, Quantum, 408/894-4000, \$320. 2GB, 5400-rpm hard drive with clear installation instructions. May 97, p. 127
- ★★ Fireball TM 32, Quantum, 408/894-4000, \$433. 3GB, 5400-rpm internal hard drive with clear installation instructions. May 97, p. 127
- ★★½ Hammer 2050iS Ultra, StreamLogic, 818/701-8400, \$919. Great performance, but pricey for a 2GB internal drive. May 97, p. 127
- ★★½ HammerDisk 2600, StreamLogic, 818/701-8400, \$2,509. Good performance but few amenities and a very high price. Aug 97, p. 115
- ★★ HammerDisk PE 640, StreamLogic, 818/701-8400, \$809. Highest-priced medium-capacity MO doesn't have great performance. Aug 97, p. 115
- ★★ Hammer Jaz Solo 1000, StreamLogic, 818/701-8400, \$589. Highest-priced third-party Jaz with only modest performance and a so-so warranty. Aug 97, p. 115
- ★★½ Jaz, Iomega, 801/778-1000, \$399. The Jaz drive to beat: good price, warranty, performance, and design. Aug 97, p. 115. **Editors' Choice** for best removable hard drive.
- ★★½ Nomai 540, Nomai, 800/556-6624, \$299. Pocket-size removable hard drive lacks essentials. Aug 97, p. 115
- ★★ PD, Panasonic, 800/742-8086, \$500. Its ability to read CD-ROMs and play CDs doesn't offset its slowness. Aug 97, p. 115
- ★★½ PDI 2100WAV, ProDirect, 612/941-1805, \$699. 2GB drive is fast with a SCSI card, but average on the external bus. May 97, p. 127
- ★★ PDI 3800, ProDirect, 612/941-1805, \$899. Big, fast, nicely priced 3.8GB hard drive. May 97, p. 127. **Editors' Choice** for best 2GB to 3GB hard drives.
- ★★ PDI 5110, ProDirect, 612/941-1805, \$399. Dismal performance and weak documentation hinder low-capacity removable hard drive. Aug 97, p. 115
- ★★½ PDI 5200, ProDirect, 612/941-1805, \$499. Higher capacity and better performance than the PDI 5110, but still no bargain. Aug 97, p. 115
- ★★½ PlayWrite 2060RW, Microboards Technology, 612/470-1848, \$685. CD-Rewritable drive is hamstrung by its lack of backward compatibility. Oct 97, p. 54
- ★★ PowerMO 2600/SCSI, Olympus, 516/844-5000, \$1,799. Fastest optical drive is well designed and reasonably priced. Aug 97, p. 115. **Editors' Choice** for best optical drive.
- ★★ RMD 1.0 ISD-G1/FWB, DynaTek, 902/832-3000, \$516. Middle-of-the-road Jaz drive is slower than most but reasonably priced. Aug 97, p. 115
- ★★ ROS 4.6 PSD-G2/FWB, DynaTek, 902/832-3000, \$2,012. Slower than others, but with twice the capacity at almost the same price. Aug 97, p. 115.

Editors' Choice for best optical drive.

- ★★½ SCSI Express 2600SME, Micro Design International, 407/677-8333, \$1,995. Slowest drive in this size group also has lowest price. Aug 97, p. 115
- ★★ Sylet 1.5GB, SyQuest, 510/226-4000, \$499. Highest-capacity removable hard drive is speedy but sensitive to SCSI-chain length. Aug 97, p. 115
- ★★ Sys.230/SCSI, Olympus, 800/347-4027, \$359. Drive has low capacity and poor performance at a price that's no bargain. Aug 97, p. 115
- ★★ Tempest 3.2, Club Mac, 714/768-8130, \$399 to \$459. 5400-rpm, 3GB drive pales next to the competition. May 97, p. 127
- ★★ Tsunami, La Cie, 503/520-9000, \$499. Snazzy case, but 3GB hard drive's not that fast. May 97, p. 127
- ★★ Zip, Iomega, 801/778-1000, \$149. Best-selling removable is glacially slow but exceptionally cheap. Aug 97, p. 115

SYSTEMS

- ★★ Maxpowr Pro 250/125, Newer Technology, 316/943-0222, \$1,395. This speedy PowerPC 750 upgrade card's only drawback is its price. Jan 98, p. 40
- ★★ Maxpowr Pro+ 266/177, Newer Technology, 316/943-0222, \$2,499. This PowerPC 750 upgrade card costs more than an entire G3 system. Jan 98, p. 40
- ★★½ OrangePC 540, Orange Micro, 714/779-2772, \$2,456. Windows 95-compatibility card offers Pentium speed at a Pentium price. Jul 97, p. 54
- ★★½ PowerBook 1400c/133, Apple Computer, 408/996-1010, \$2,700. The least expensive PowerBook is not cheap enough to justify its savings over the faster models. Sep 97, p. 108
- ★★½ PowerBook 1400c/166, Apple Computer, 408/996-1010, \$3,000. Apple's fastest budget notebook is still fairly slow. Dec 97, p. 74
- ★★ PowerBook 2400c/180, Apple Computer, 408/996-1010, \$3,000. This IBM-designed subnotebook is fast and lightweight, marred only by a tiny keyboard. Nov 97, p. 50
- ★★ PowerBook 3400c/180, Apple Computer, 408/996-1010, \$3,200. A better value than its slightly faster 3400c/200 sibling, but it won't satisfy as a desktop replacement. Sep 97, p. 108
- ★★ PowerBook 3400c/200, Apple Computer, 408/996-1010, \$3,800. Luxury notebook with cool features is worth the weight, especially at its lower price. May 97, p. 50. **Editors' Choice** for best portable Mac system. Sep 97, p. 108
- ★★ PowerBook 3400c/240, Apple Computer, 408/996-1010, \$4,500. This fast PowerBook is hobbled by lack of CPU upgradability but still makes a fine desktop replacement. Dec 97, p. 108
- ★★ Power Macintosh 4400/200, Apple Computer, 408/996-1010, \$1,500. Apple's cheapest Mac is slow and has too little RAM. Jan 98, p. 93
- ★★½ Power Macintosh 5500/225, Apple Computer, 408/996-1010, \$2,000. All-in-one system is great for schools, despite poor expandability. Jan 98, p. 93
- ★★½ Power Macintosh 6500/225, Apple Computer, 408/996-1010, \$1,600. Affordable basic system with limited expandability. Jan 98, p. 93
- ★★½ Power Macintosh 6500/250, Apple Computer, 408/996-1010, \$2,000. Great software bundle, but overpriced and limited in upgradability. Jan 98, p. 93
- ★★½ Power Macintosh 9600/300, Apple Computer, 408/996-1010, \$4,898. Although it's the fastest 604e-based Mac, the 9600/300 costs way too much for its performance. Dec 97, p. 94
- ★★ SuperMac C500LT/200, Umax Computer, 510/226-6886, \$995. Bare-bones system that is not eas-

continues

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Circle 187 on reader service card

Mouse Ratings

ily expanded. *Jan 98, p. 93*

- ◆◆◆ SuperMac C600/200, Umax Computer, 510/226-6886, \$1,195. Its low price will attract students and infrequent users. *Jan 98, p. 93*
- ◆◆◆ SuperMac C600LT/240, Umax Computer, 510/226-6886, \$1,395. A good value for students and basic home-office use. *Jan 98, p. 93*
- ◆◆◆ SuperMac C600x/240, Umax Computer, 510/226-6886, \$1,795. A system hampered by lack of expansion and high price for its performance. *Jan 98, p. 93*
- ◆◆◆ SuperMac C600x/280, Umax Computer, 510/226-6886, \$1,995. A fast but pricey system for home and small-business users. *Jan 98, p. 93*
- ◆◆◆ SuperMac J700/180, Umax Computer, 510/226-6886, \$1,795. Solid system but not as fast as Apple's new Power Mac G3 series. Price drops will make this Mac more affordable. *Jan 98, p. 93*
- ◆◆◆ SuperMac S900/250, Umax Computer, 510/226-6886, \$3,858. This highly expandable, fast system is a winner for media creators. *Dec 97, p. 94*
- ◆◆◆ SuperMac S900/250DP RAID, Umax Computer, 510/226-6886, \$7,237. This dual-processor Mac works miracles with Photoshop. *Dec 97, p. 94*

VIDEO DISPLAY

- ◆◆◆ AlphaScan 711, Sampo Technology, 770/449-6220, \$599. This monitor has an unbeatable price for a great picture; limited color features and on-screen controls. *Jul 97, p. 117*
- ◆◆◆ AlphaScan 760, Sampo Technology, 770/449-6220, \$799. This monitor's screen is beautiful, but on-screen controls are ugly and not user-friendly. *Jul 97, p. 117*
- ◆◆◆ AppleVision 1710, Apple Computer, 408/996-1010, \$799. This monitor has a fine picture, affordable price, plus excellent software control interface. *Jul 97, p. 117*
- ◆ Crystal Lake 17, Pacom Data, 408/764-0590, \$549. Sharp picture and rock-bottom price, but this monitor has limited features and controls. *Jul 97, p. 117*
- ◆◆◆ Diamond Pro 87TXM, Mitsubishi Electronics America, 714/220-2500, \$829. Solid image quality, great controls, at a realistic price for a monitor. *Jul 97, p. 117*
- ◆◆◆ DJ702e-M, Mag Innovation, 714/751-2008, \$659. This 17-inch monitor has good image quality and a good price, with cool hardware controls. *Jul 97, p. 117*
- ◆◆◆ DX700T-M, Mag Innovation, 714/751-2008, \$799. Sharp image, sensible controls, but this monitor's picture is too dim to make the first rank. *Jul 97, p. 117*
- ◆◆◆ EO75-M, Princeton Graphic Systems, 714/751-8405, \$799. This monitor balances a terrific picture and low price with iffy controls and chintzy swivel. *Jul 97, p. 117*
- ◆◆◆ EO76-M, Princeton Graphic Systems, 714/751-8405, \$799. Despite poor on-screen controls, this monitor is a fair deal with good picture and price. *Jul 97, p. 117*
- ◆◆◆ FlexScan FX-C5, Eizo Nanao Technologies, 562/431-5011, \$948. Good-looking monitor, but has somewhat mystifying hardware controls. *Jul 97, p. 117*
- ◆◆◆ FlexScan TX-C75, Eizo Nanao Technologies, 562/431-5011, \$1,299. Excellent image quality and software interface, but this monitor is exorbitantly expensive. *Jul 97, p. 117*
- ◆◆◆ GDM-W900, Sony Electronics, 408/955-5142, \$4,999. A wide-screen monitor for the color

connoisseur. *Jun 97, p. 84*

- ◆◆◆ Mazellan 17PX, Hansol Multitech, 714/562-5151, \$899. Affordable, good image quality, and highly functional hardware controls in this monitor. *Jul 97, p. 117*
- ◆◆◆ Multigraph 447Xi, Nokia Display Products, 415/331-4244, \$925. Great color and great controls, but the monitor's price is above average. *Jul 97, p. 117*
- ◆◆◆ Multiple Scan 1705 Display, Apple Computer, 408/996-1010, \$649. Good image quality in this monitor, but it tends to bloom at high brightness. *Jul 97, p. 117*
- ◆◆◆ Multiscan 17self, Sony Computer, 408/894-0555, \$999. A slight magenta cast and high price tag, but this monitor is otherwise a good choice. *Jul 97, p. 117*
- ◆◆◆ Multiscan 200sf, Sony Computer, 408/894-0555, \$799. Excellent quality display plus an elegant interface and surprisingly affordable make this monitor a standout. *Jul 97, p. 117. Editors' Choice* for best 17-inch monitor.
- ◆◆◆ MultiSync P750, NEC Technologies, 630/775-7900, \$899. This 17-inch monitor is worth the money for its brilliant picture and great on-screen controls. *Jul 97, p. 117*
- ◆◆◆ MultiSync XV17+, NEC Technologies, 630/775-7900, \$749. This 17-inch monitor has richly colored picture and superb controls—a good bargain. *Jul 97, p. 117*
- ◆◆◆ Optquest V773, ViewSonic, 909/869-7976, \$599. The best combo of image quality and controls we've seen in a monitor for under \$600. *Jul 97, p. 117*
- ◆◆◆ PanaSync/Pro P17, Panasonic Computer, 201/392-4500, \$899. This monitor features high-quality image, controls, and support, like its lower-price sibling, the S17. *Jul 97, p. 117*
- ◆◆◆ PanaSync S17, Panasonic Computer, 201/392-4500, \$729. A sensible monitor choice—good picture, controls, price, and support. *Jul 97, p. 117*
- ◆◆◆ Pivot 1700, Portrait Displays, 510/227-2700, \$1,099. This monitor's unique pivoting feature isn't cheap, but it's the only one in town. *Jul 97, p. 117*
- ◆◆◆ PT775, ViewSonic, 909/869-7976, \$999. Good image quality and controls, but this monitor's price doesn't match its performance. *Jul 97, p. 117*
- ◆◆◆ RasterOps SuperScan Mc 600, Hitachi/NSA, 617/461-8300, \$799. Slightly clunky controls, but decent picture—a good monitor choice for the budget-minded. *Jul 97, p. 117*
- ◆◆◆ RasterOps SuperScan Mc 611, Hitachi/NSA, 617/461-8300, \$949. This monitor has merely average image quality for the price, and hard-to-see controls. *Jul 97, p. 117*
- ◆◆◆ SyncMaster 17GLi, Samsung Electronics America, 201/229-4000, \$789. Affordable, good-looking monitor with smart, snazzy controls. *Jul 97, p. 117*
- ◆◆◆ SyncMaster 17GLsi, Samsung Electronics America, 201/229-4000, \$1,019. This monitor outperforms the 17GLi and has custom color controls, but at a big price hike. *Jul 97, p. 117*
- ◆◆◆ VisionMaster 17, Iiyama North America, 215/957-6543, \$799. This monitor has great image quality at a very good price; slightly convoluted controls. *Jul 97, p. 117*
- ◆◆◆ VisionMaster Pro 17, Iiyama North America, 215/957-6543, \$899. A beautiful, feature-rich, and sensibly priced monitor; slightly confusing controls. *Jul 97, p. 117*
- ◆◆◆ Visual Sensations VS-9, KDS, 714/379-5599, \$753. Good-looking monitor, but inelegant controls and inflexible swivel stand. *Jul 97, p. 117*
- ◆◆◆ WyseVision WY-782D, Wyse Technology, 408/922-4300, \$949. Compelling picture and price, but this monitor is marred by awkward controls. *Jul 97, p. 117*

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Gadgets!

BY HENRY BORTMAN

You can't live without them. Well, actually, you *can* live without them—but who would want to? They're fun to use.

They're fun to look at. Gadgets are great things to show off to your pals—although it's better if they just happen to notice them. Above all else, gadgets are one of the best forms of retail therapy available.

So *Macworld* did a bit of window shopping and found 22 amazing high-tech toys. Our treasures range in price from \$20 to \$7,999. In other words, there's bound to be something that fits your budget. So feast your eyes on our findings, get out your checkbook, and start buttering up your significant other. This is stuff you're not going to want to live without.



MUST-HAVE ITEMS



BOSE

SoundStation Premier

PHOTOGRAPHY BY MARK JOHANN



CHATTER BOX

Finish your monthly report. Call your client to schedule a time to show him your proposal. Pay your phone bill. Pick up a loaf of bread, a carton of milk, and a stick of butter. Schedule your kid's orthodontist appointment. The list of details you have to remember is endless, and that Day Runner's just too darn big to pull out every time you think of something important. Try Sony's **ICD-70 IC Chip Recorder** (left) instead.

The ICD-70 is a voice recorder that stores information in memory rather than on tape. Small enough to fit easily in your hand, the ICD-70 can store up to 24 minutes of very good voice-quality sound, in hundreds of randomly accessible (and randomly erasable) chunks. VOR (voice-operated recording) eliminates pauses from your speech, thereby reducing memory use.

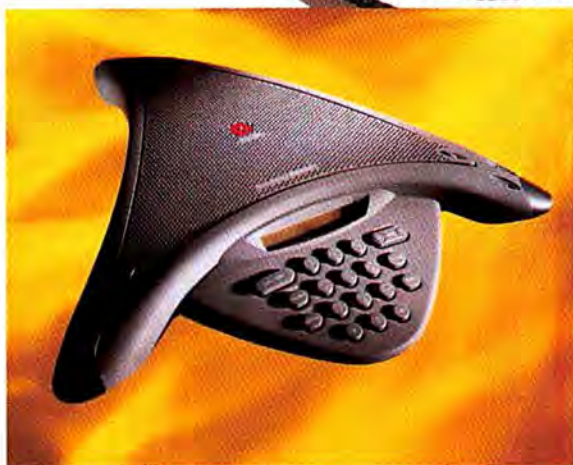
—Sony Electronics, 800/222-7669, www.sony.com; \$199.

WINDOW TO THE FUTURE

Our most expensive gadget represents a stunning breakthrough in display technology. NEC's **MultiSync LCD2000** (right, bottom) is a 20-inch LCD flat-panel display. Typically, LCD panels are plagued with problems like bad pixels and dramatic color changes when you move your head even slightly too far to one side. But the MultiSync LCD2000 shows no evidence of these problems. Its image is gorgeous: we saw no bad pixels on the display we examined.

We also found NEC's claim of a full 160-degree viewing angle to be valid. In a *Macworld* conference room full of people who ringed three sides of the table on which the monitor was sitting, everyone could see the screen without distortion or color shifting. The LCD2000 supports resolutions up to 1280 by 1024 pixels. It weighs only 22 pounds, light enough to be transported easily from room to room. And it's less than 9 inches deep! In short, it's a jaw-dropper.

—NEC Technologies, 630/467-5000, www.nec.com; \$7,999.



POLISHED SPEAKER

Sometimes you wonder, why do you even bother trying to use a speakerphone? "Hello? Can you hear me?" You know the drill. Polycom, with its **SoundStation Premier EX** (left, top) speakerphone, appears to have solved the problems that plague these necessary (but sometimes evil) devices.

For starters, the SoundStation Premier's speaker quality is excellent. More important, you can talk and listen at the same time. In addition, the EX model comes with two satellite microphones, so that everyone, even in a large conference room, can be heard. It even comes with a remote control, complete with a built-in touch-tone keypad. True, the SoundStation Premier is expensive, but if a speakerphone that works is an important component of making your business successful, it's worth the price. Oh, and lest we forget, it's totally cool-looking; those of us at *Macworld* have taken to calling it the Batphone.

—Polycom, 408/526-9000, www.polycom.com; \$1,595.



GADGETS CAN TRANSFORM YOUR ENVIRONMENT

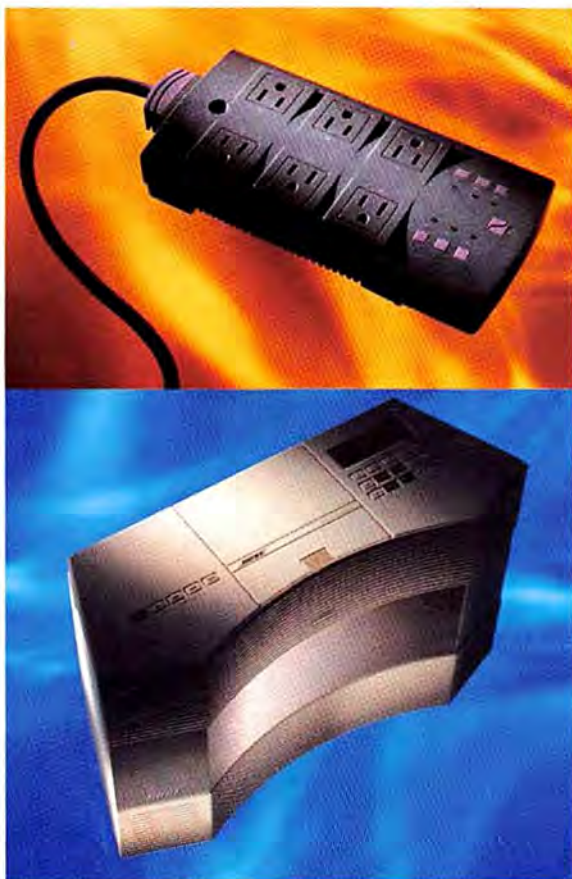
SMALL BOX, BIG SOUND

Looking for great sound but short on space? Point your ears toward the Bose **Acoustic Wave Music System** (right, bottom). Don't let this system's small size fool you—when we say great sound, we mean it.

This powerful mini audio system, which includes an AM/FM tuner, a CD player, and some brilliant acoustical engineering, in its output quality rivals systems that cost far more and take up many times more space. The Acoustic Wave weighs only 15 pounds and can fit easily on an office or home-office bookshelf.

But while the system appears modest on the outside, a nearly 7-foot-long acoustical chamber, which Bose calls a *waveguide*, snakes its way through the system's interior, producing such incredibly rich bass response, you'll find yourself looking around for a hidden subwoofer, and if you plug a microphone into Acoustic Wave, you've got an instant public-address system!

—Bose, 508/879-7330, www.bose.com; \$1,079.



ABSOLUTE POWER

Tired of the toggle-switch two-step? Every time you go to turn on your computer, you have to turn on half a dozen peripherals first. The **PowerKey Pro 600** (left, top), a programmable power strip from Sophisticated Circuits, solves the problem. The PowerKey comes with an application that lets you control each of its six outlets. For example, you can turn on your external hard drives before your computer powers up, and add a keystroke to power up your printer. You can also plug the PowerKey Pro 600 into a phone line so that you can start your computer and/or selected peripherals remotely—even when your computer has crashed.

—Sophisticated Circuits, 425/485-7979, www.sophisticated.com; \$200.

THE WORLD'S COOLEST CORDLESS

A cordless phone designed by Frogdesign, the same folks who created several classic Macintosh form factors? It's true. Meet the Astralink **ClipFone** (right). Small and light, the ClipFone can make an elegant addition to your living room, or home office, or kitchen, or bedroom—or all four. The ClipFone can support as many as four separate, color-coded cordless handsets (it comes standard with two). If one handset is in use, the others are turned off, so you can have a private conversation. And—get this—you can transfer calls from, say, the red handset to the green handset with the push of a button. Sound quality: average. Coolness factor: extreme.

We *did* notice one annoying trait, however: when you're talking on one handset and someone hangs up another handset on the base station, you hear a disturbingly loud burst of electrical static.

—Astralink Technologies, 314/514-0796; \$159, \$60 for extra handset and remote charger.



THE PAGER THAT TALKS BACK

Sure, pagers are handy. The trouble is, you never get the last word—or the first one, for that matter. But Motorola's **PageWriter 2000** (right, bottom) isn't like other pagers. In addition to receiving alphanumeric messages, you can send messages to other one- or two-way pagers, transmit e-mail via the Internet, and even send faxes. The device contains a gray-scale display as well as a full QWERTY keyboard—albeit one so small that it's better suited to Thumbelina. From the graphical interface, you can use the PageWriter's built-in address book for frequently used phone numbers and e-mail addresses or even take notes using a built-in note-taking application. And its NiMH battery operates for a whole week on a one-hour charge.

—Motorola, 800/548-9954, www.mot.com/PageWriter/; \$399, \$439 bundled with Mac/PC connectivity kit.



ROLL OUT THE MODEM

You want to check your e-mail. But the hotel phone is hardwired, and the wall jack is behind the bed. So you pull out your spare phone cord, inevitably to discover that it's tangled beyond recognition. And you wonder: if scientists can send the *Pathfinder* to Mars, why can't someone figure out a way to make a snarl-free phone cord?

Someone has. Next time you travel, pack Port's **SureLink Retractable Telephone Cord** (left, top). This handy accessory is an 8-foot-long phone cord that reels into a compact plastic case.

Port also has a couple of other products of interest to the road warrior: Defcon 1, a motion detector with a very loud buzzer, provides security for PowerBooks that might otherwise wander off on their own; and SureLink Connection packs provide AC and telephone converters for those traveling abroad.

—Port, 203/852-1102, www.port.com; \$14.95.

"KIRK TO ENTERPRISE . . ."

It's not cheap, but if you want to have the absolutely hottest cell phone on the block, the Motorola **StarTac 8500g 1.9pcs** (left) is the phone you're looking for. It's so small and light that you barely know you're holding it, and it flips open like a communicator from the original *Star Trek* TV series. (Well, OK, you have to use both hands instead of just wiggling your wrist, and you'll have to supply your own sound effects.) Because the StarTac is based on digital technology, its sound is clean and crisp—there's none of the static associated with cell phones, and very few dropouts. Depending on which battery option you choose, you can get between 70 and 230 minutes of continuous use without needing a recharge. And get this: it has dual batteries, so you can hot-swap them, even in the middle of a call.

Other distinguishing characteristics include a built-in 100-entry phone book; call waiting, call holding, and call forwarding; and a host of accessories, including the StarTac necklace, purse pack, and armband for those who truly want to make a cellular fashion statement.

—Motorola, 847/523-8755, www.startac.com; \$1,795 (when purchased with VIP bundle directly from Motorola).



THAT TRAVELING DOESN'T HAVE TO BE A DRAG

THE COMPUTER WITHIN

It's a phone. . . . It's a computer. . . . No, it's the Nokia 9000i Communicator (right). On the outside, this cellular chameleon looks like a mild-mannered digital phone. The fact that it's digital makes for very clean-sounding transmission and reception, but digital phones are a dime a dozen these days. What makes the 9000i different is the secret identity lurking inside: a computer with a 386 CPU, 8MB of RAM, and Geoworks' GEOS operating system, along with contact-management, calendar, and note-taking applications. So when it's properly configured, you can use the 9000i—are you ready?—to send and receive faxes and e-mail and to browse the Web. It even includes an IRDA infrared port, which lets you print stored documents to IRDA-configured printers such as the Hewlett-Packard LaserJet 6Pse.

—Nokia, 888/665-4228, www.nokia.com; \$1,000 (price may vary depending on carrier).



THE WIRELESS WEB

You've been here before: you're stuck at the airport, your flight's delayed, you can't get to your e-mail, and you're miserable. But help is at hand, in the form of Metricom's **Ricochet SE wireless modem** (left). If you're in Metricom's coverage area, you can make a TCP/IP connection via radio and surf the Web or send and receive e-mail. You get data throughput of somewhere between 14.4 and 28.8 Kbps. The supplied battery is good for four to six hours of use. Here's the bad news: Metricom currently offers coverage only in San Francisco; Seattle; and Washington, D.C.; with Los Angeles scheduled to come online soon. In addition, Metricom provides service at airports in a few other cities.

—Metricom, 408/399-8200, www.ricochet.net; \$349.

CUSTOM WAKE-UP CALL

Music lovers who are sick of waking to impossibly loud wake-up calls or strange radio stations can rejoice—once you've got a Sony **ICF-CD1000** (left), you can unplug the hotel phone and wake up to the sounds of your favorite CD. That's because this travel alarm's got a built-in AM-FM radio and a CD player. You can even wake to a specific song, in case the CD's first track isn't early-morning material. The ICF-CD1000 also offers a handy time-zone chart to let you quickly set your clock to the right time wherever you may be.

—Sony Electronics, 800/222-7669, www.sony.com; \$220.



THE DOUBLE-DUTY CAMCORDER

Getting neck strain because you're dragging your camcorder around on one shoulder and your still-image camera on the other? Then you might be interested in the ultimate in digital-camera gadgetry, Canon's **Optura** (left). The Optura is a digital video camera engineered to support still images as well. Although stills are captured as digital video frames, Canon says its Progressive Scan technology can capture up to 30 still frames per second. The Optura has both a traditional eyepiece-type viewfinder and a small LCD-panel display, and supports a combination of optical and digital zooming up to 35X. It offers not only composite-video and S-Video output, but FireWire (IEEE 1394) as well. (We were able to make a FireWire connection to a Macintosh using Adaptec's FireCard AHA-8940 and an alpha version of its FireWire drivers.)

The problem is, for all this engineering, the Optura's image quality doesn't have much to recommend it over images captured by more-established Hi-8 analog camcorders. Its still images displayed noticeable pixelization. But Canon's on the right track. The Optura undoubtedly points the way to the future of digital imaging—but this first offering may be a bit green to justify such a high sticker price.

—Canon USA, 516/328-5000, www.canondv.com; \$2,699.



PICTURE DISK

If convenience is high on your list of priorities when shopping for a digital camera, you'll definitely want to look into the Sony **Digital Mavica** (right, bottom). The Mavica is so easy to use because it doesn't require a cable or any special software: it stores pictures on a standard high-density floppy disk.

You can store up to 40 images (640 by 480 pixels at 24-bit color depth) on one disk. Image quality is fine for casual use and for small images destined for the Web, but you probably won't want to submit any of your shots to *National Geographic*. The Digital Mavica comes in two models, the MVC-FD5 (shown here) and the MVC-FD7. The FD7 has more advanced features, including a zoom lens, enhanced exposure and focusing capability, and a few built-in special effects. —Sony Electronics, 201/930-1000, www.sony.com/mavica/; \$599 for the MVC-FD5, \$799 for the MVC-FD7.



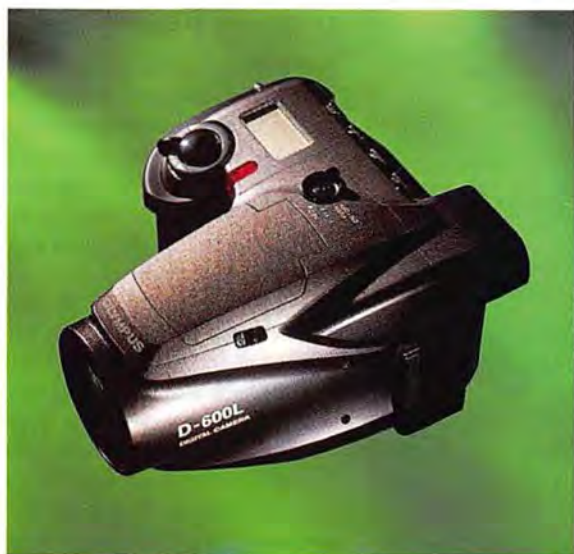
DIGITAL CAMERA WITH A TWIST

For a camera, being digital has some distinct advantages. Take the case of the **Dimage V** (left, top), from Minolta. Its lens not only swivels but is detachable. This compact camera comes with a 3.3-foot cord that connects the lens to the camera body. It's great for taking pictures over the office cubicle wall or shooting over the heads in a crowd. Unfortunately, the Dimage's image quality is . . . we'll say "consumer grade." But if your requirements aren't too demanding, the added flexibility—literally—may prove sufficient compensation.

The Dimage includes a zoom lens and a 1.8-inch color LCD display for viewing images. It can store up to 40 images (16 in high-quality mode) at 640 by 480 pixels on a 2MB Smart-Media card (a postage-stamp-size memory card). The Dimage comes bundled with both PC and Mac serial cables, and with Adobe Photo-Deluxe for both platforms. —Minolta, 201/825-4000, www.minoltausa.com; \$599.



WILL HELP YOU GET THE PICTURE



FABULOUS PHOTOGRAPHY

Until Olympus came out with its **D-600L** (left) digital still camera, digital-camera customers had a tough choice: pay upward of \$10,000 or live with inferior images. You no longer have to make that choice.

Although it costs just a bit more than twice what most consumer-grade digital cameras go for, the D-600L offers superb quality that puts it in the same league as high-end professional models. The images that the D-600L captures are stunning, offering excellent clarity, detail, and color. In super-high-resolution mode, the D-600L captures images at 1280 by 1024 pixels, a resolution more than four times that of most digital cameras. The D-600L stores captured images on removable SmartMedia cards; the camera includes one 4MB card. The camera also offers a zoom lens, a built-in flash, and a serial cable to connect it with your computer. It consumes batteries with abandon; we recommend that you buy the optional AC adapter, unless you own stock in Duracell or Energizer.

—Olympus, 516/844-5000, www.olympus.com; \$1,299.

HOME-MOVIE MOGUL

OK, so you've got a camcorder and you've got a computer. But you just couldn't justify plunking down the big bucks for the hardware and software to make them talk to each other. Now you don't have to. Iomega's **Buz Multimedia Producer** (right) offers just about everything you need in one under-\$200 package. The Buz Box is an attractive breakout box that provides you with easy desktop access to composite-video, S-Video, and stereo audio-in and -out ports, so you don't have to fiddle around with plugging and unplugging cords on the back of your Mac. It attaches to an included PCI card that also offers an Ultra SCSI Port—for connecting Zip and Jaz drives, of course. Bundled with the hardware are PictureWorks' HotShots image-, sound-, and video-cataloging software; Iomega's own RecordIt audio-recording software; and a still-to-be-determined Mac video-capture and -editing program. That uncertainty is why you probably won't be able to buy a Mac version of the Buz for a few months. . . . But hey, at least you know it's coming.

—Iomega, 801/778-1000, www.iomega.com; \$199.



FLOPPIES BEGONE!

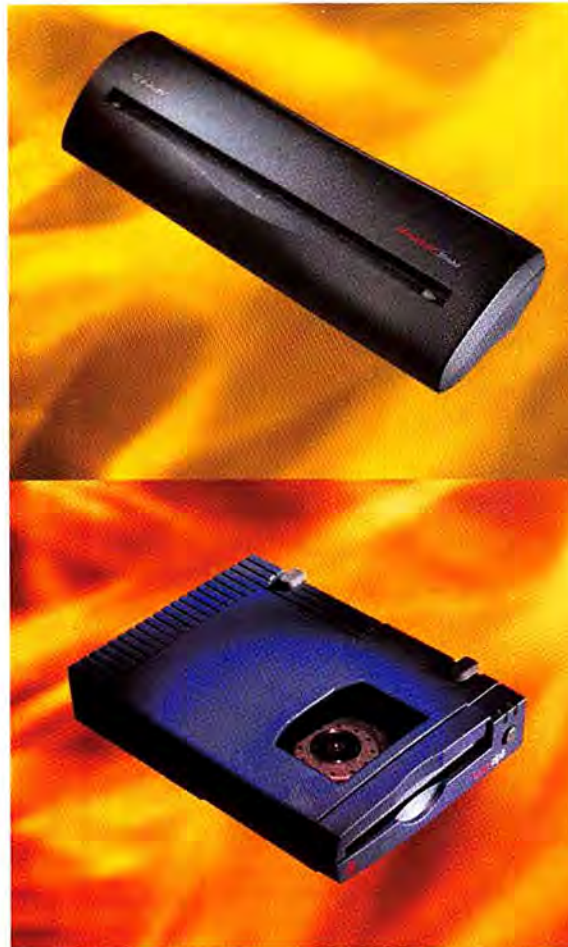
Been avoiding backups because you can't even fit your *data* on floppies anymore, let alone your carefully tuned System Folder and applications? You need an **omega Zip Drive** (right, bottom). Everyone else has one. Why should you be different?

The basics (in case somehow you've missed the whole phenomenon): Zip drives are small, portable removable-cartridge disk drives that hold 100MB cartridges. The cartridges sell for \$10 to \$15, depending on how many you buy at once.

Omega has addressed the original Zip's drawbacks, along with providing support for both SCSI and parallel-port connections in a single device, with its new ZipPlus drive. The original Zip's cartridges don't have a physical locking mechanism; to lock them you have to use proprietary omega software. The drives themselves don't win any speed contests, nor do they have a power switch. The ZipPlus costs about \$50 more than the traditional Zip, which will remain in omega's product lineup as well.

And now PowerBook users don't have to feel left out of the Zip revolution: VST Technologies' new PowerBook Zip Drive (508/263-9700, www.vsttech.com; \$350) fits in the drive bays of 1400- and 3400-series PowerBooks.

—Omega, 801/778-1000, www.iomega.com; \$149 (\$199 for ZipPlus).



HANDHELD HELPER

The 3Com **PalmPilot Personal Edition** (right) comes closer than any other PDA we've seen to marrying the processing power of a handheld computer with the convenience of a piece of paper. Small enough to fit in your hand (or your shirt pocket), the PalmPilot weighs only 5.5 ounces. It comes with date book, address book, memo pad, and to-do list applications; other applications are available from third parties.

The PalmPilot's Graffiti handwriting recognition requires you to use a prescribed sequence of strokes for forming each letter and number, but once you get used to it, it's very accurate. With the optional PalmPilot MacPac you can connect the PalmPilot to your Mac. The Pilot Desktop software contains the same applications as the PDA, letting you enter information via your computer's keyboard. You can synchronize the PalmPilot to the desktop software with a single press of the HotSync button on the docking cradle.

Those interested in a PDA that is more Mac-friendly, more handwriting-agnostic—and way more expensive—may prefer to cast their gaze in the direction of Apple's new Newton model, the MessagePad 2100 (408/996-1010, www.apple.com; \$999). Its hot new features include more memory (4MB), better performance, and updated versions of bundled software, with a focus on improved communications.

—3Com, 408/848-5604, www.palmpilot.com; \$249, \$15 for MacPac software and adapter cable.



SCAN AND DELIVER

Ever wish you could use your computer to send faxes, prepare expense reports, or archive documents? Then you may already have a Visioneer **PaperPort** (left, top) on your desktop. But if you've been holding out for one that will also let you scan in those vacation snapshots of yours, now you've got no excuse: the new Visioneer PaperPort Strobe lets you scan in brilliant 24-bit color at a resolution of 300 by 600 pixels per inch, in addition to the PaperPort's impressive list of other capabilities. The Strobe is way cooler-looking, with a compact design that's also easier to use. And if the Strobe's look isn't enough to convince you, we can also reassure you that the accompanying PaperPort software has been given a big upgrade.

—Visioneer, 510/608-6300, www.visioneer.com; \$299.

THE MAGIC EYEBALL

If you don't already have a Connectix eyeball camera staring at you from atop your monitor, what are you waiting for? The **Color QuickCam for Macintosh** (right), as it's officially known, is the most compact and least expensive color digital camera you can buy, and it can capture either still images or full-motion video at up to 24 frames per second. Professionals will snub it—the image quality isn't great—but it's more than adequate if you want to set up a Web camera featuring a live image of your aquarium or your desk. The truly paranoid will want to add Connectix's Digital Radar (\$30), which lets you use the QuickCam as a motion-activated security camera; just about anyone will want the QuickCam Tripod (\$15; shown here), which provides added flexibility in pointing your eyeball in the desired direction.

—Connectix, 415/571-5100, www.connectix.com; \$188.

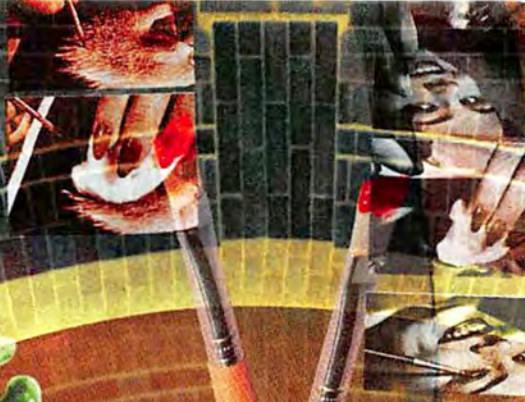


PUBLIC SPEAKER

If you're looking for speakers to attach to your computer, you won't find a better deal than Cambridge Soundworks' **PC Works** (right). Featuring a pair of 3-inch-cube satellite tweeters and a compact subwoofer that easily fits under a desk, the PC Works is unquestionably the best-sounding speaker system you can buy for \$100. It produces incredibly clear and crisp sound throughout the entire audible-frequency range. Whether you're listening to classical, jazz, rock, or the paintbrush sounds in *Kid Pix*, you owe it to yourself to enhance your computer's audio output with this little gem.

—Cambridge Soundworks, 617/332-5936, www.hifi.com; \$100. **m**





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FUEL GAUGE

BATTERY CHARGE LEVEL

ENGINE OIL PRESSURE

ENGINE WATER TEMPERATURE



Best Photoshop Plug-ins

Deke McClelland
tracks down 16 terrific
new graphics tools

You just landed a dream job. Great money, excellent bennies. On orientation day, the new boss invites you to select between two cubicles. One contains a PC equipped with Adobe Photoshop; in the other sits a Mac with plenty of other graphics software but no Photoshop. Which will it be?

If you're like most computer artists, you'll take a deep breath and duck into the cube with Photoshop. As heretical as it may sound, many longtime graphics professionals value this one application more than their operating system itself. Without the Mac OS you may be less efficient, but without Photoshop your work comes to a grinding halt.

When a program rivals the prominence of an operating system, it becomes a kind of OS of its own. You buy other products with Photoshop in mind. The good thing about this is that every time you run into a brick wall with Photoshop, there's a developer out there trying to make that wall disappear. The blasting tool of choice? The plug-in.

Just as system extensions enhance the capabilities of the Mac OS, plug-ins add power to Photoshop. Since we last compiled our list of peerless plug-ins (see "Top 20 Photoshop Plug-ins," September 1996), the number has swelled so

dramatically that we had to limit our current list to programs that have upgraded or originated in the last year. Few of us will buy a plug-in that costs as much as Photoshop itself, so we also set a price ceiling of \$300. We've arranged the plug-ins into four categories: productivity plug-ins; effects plug-ins; 3-D, type, and texture plug-ins; and plug-ins that help prepare images for posting on the World Wide Web. We also asked two veteran artists to try out some of these tools and tell us what *they* thought. (See the sidebars "Dimensional Dynamics" and "Eye-Catching Inspirations.")

Incidentally, most of our supreme plug-ins either debuted on the Mac or have never made it to Windows at all. So even if you live and die for Photoshop, you may want to think twice about forsaking that Mac. Besides, that dream job I mentioned wasn't so great. Where do they get off trying to stick *you* into a cubicle?

Productivity Tools

These humdrum heroes won't take you to higher planes of artistry, but they will help you get your work done efficiently. If you buy just one plug-in this year, select it from this list.

Test Strip 1.1

Regardless of your methods, it's impossible to know precisely how a printed piece will look until it's on paper. After that first Matchprint comes the second-guessing: Could it use more yellow? Is it under-saturated? Or is the contrast simply too low? Vivid Details' Test Strip all but eliminates the guesswork.

This essential and affordable prepress filter lets you preview regular variations in hue, saturation, and exposure. You can even browse through a series of manipulations and then compare the original with the corrected final. When you finish, you use Test Strip to generate a comparative proof (see the screen shot "Matchprints for Morons") and then you output your Matchprint.

Granted, I could wish for more, such as the option of generating multiple colored thumbnails instead of simply test strips so that I could evaluate each variation applied to the *entire* image. And given the difficulty of predicting the focus of a CMYK separation, Test Strip would double its value if it integrated Unsharp Mask into its regimen. But these are hardly reasons to pass Test Strip by. If you own a color printer, you definitely need this plug-in.

Genuine Fractals 1.0

Altamira Group wants you to stop shipping those 100MB images for high-end output and start e-mailing them. How? The company claims that its plug-in, Genuine Fractals, can take a 25MB scan, compress it down to as small as 2MB, and then expand it to virtually any output resolution without a loss in quality.

It works its magic by identifying color and texture groupings and then rewriting these groupings by using mathematical

fractals instead of pixels. I believe it's misleading to call this Fractal Image Format (FIF) "resolution independent," as Altamira does, because the fractal data is ultimately no better than the original scanned pixels. But it's safe to say that FIF does not adhere strictly to pixels.

In my tests, the plug-in did a very nice job of up-sampling artwork without blurring vital edge detail (a downside to Photoshop's bicubic interpolation). It takes some time to compress and decompress FIF files—several times longer than what's needed for a similar JPEG file—but for those who want to shorten transmission times and stop fretting about final output resolution, Genuine Fractals will prove to be an impressive, perhaps even revolutionary tool. (For more information, see *Reviews*, in this issue.)

Extensis Mask Pro 1.0

Photoshop's masking capabilities are extensive, but they're hardly easy to use. So it's fortunate that two recent plug-ins—Mask Pro, from Extensis, and MagicMask, from Chroma Graphics (\$100, www.chromagraphics.com)—automate this process. Between the two, I come down firmly on the side of Mask Pro, a top-notch masking utility with its own toolbox and palettes.

Mask Pro approaches masking as a matter of color. Using eyedroppers, you lift colors that appear inside and outside

EDITORS CHOICE

Productivity Tools

★★★★ Extensis Mask Pro 1.0 Simplifies masking in Photoshop with its color-based and automated masking tools. **Company:** Extensis (503/274-0530, www.extensis.com). **List Price:** \$300.

★★★★ Extensis PhotoTools 2.0 Well-rounded collection of productivity filters includes new effects and an improved text-handling utility. **Company:** Extensis (503/274-0530, www.extensis.com). **List Price:** \$130.

★★★★½ Genuine Fractals 1.0 Saves images to nonpixel format for better compression and upsizing. **Company:** Altamira Group (818/556-6099, www.altamira-group.com). **List Price:** \$159.

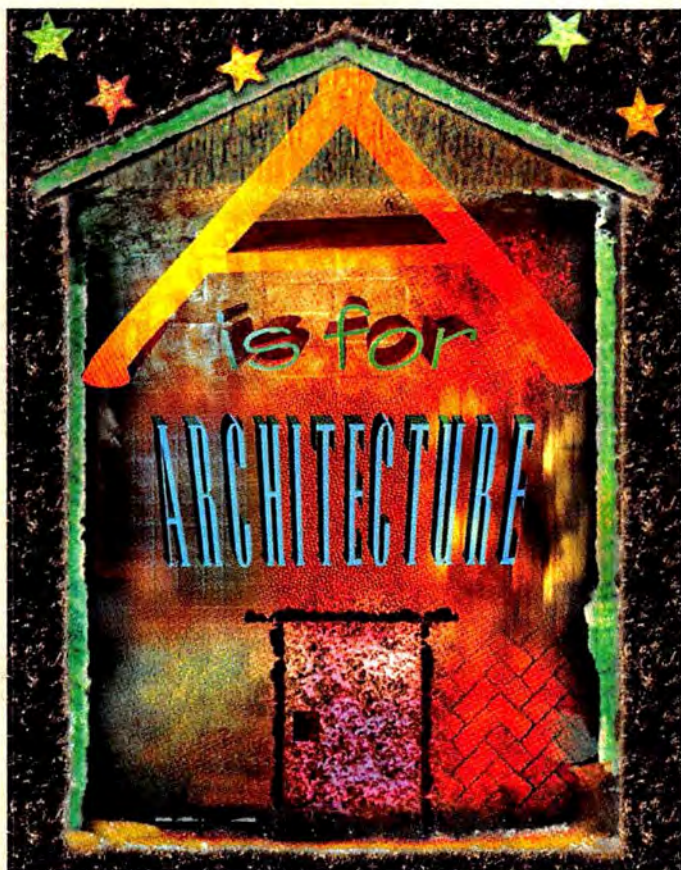
★★★★½ Test Strip 1.1 Allows you to see, and print, a range of color corrections side by side for comparison. **Company:** Vivid Details (805/646-0217, www.vividetails.com). **List Price:** \$149.

the mask, which Mask Pro calls "keep" and "drop" colors, respectively. Then you paint with an intelligent brush that erases away the background and brings your selection—the foreground—into view.

Using Mask Pro isn't necessarily a piece of cake. Getting the knack of selecting optimal keep and drop colors takes some practice, and for best results, you have to define a channel or layer mask prior to choosing the filter. But your efforts are rewarded, as Mask Pro is truly a professional masking tool and doesn't fail to address important details for you. For example, the plug-in automatically antialiases the edges of masks for naturalistic effects (something MagicMask neglects to do) and throws in lots of time-saving keyboard shortcuts. At \$300, Mask Pro barely qualifies for inclusion in our top plug-ins list, but it's worth the money if you need a program that tackles the complexities of masking without attempting to whitewash them away.



Matchprints for Morons True to its name, Vivid Details' Test Strip applies color corrections in rows or columns—just as with a photographer's test strip—so that you are able to make side-by-side comparisons when you print Matchprints. Straightforward and logical, this plug-in removes virtually all the guesswork from process-color printing.



FAST. EASY. INTUITIVE. THOSE THREE WORDS SUM UP Andromeda's Tectures and Vertigo's HotText for well-known digital artist Diane Fenster. "If you're looking for a quick way to make textures or dimensional lettering, these two are great," she says.

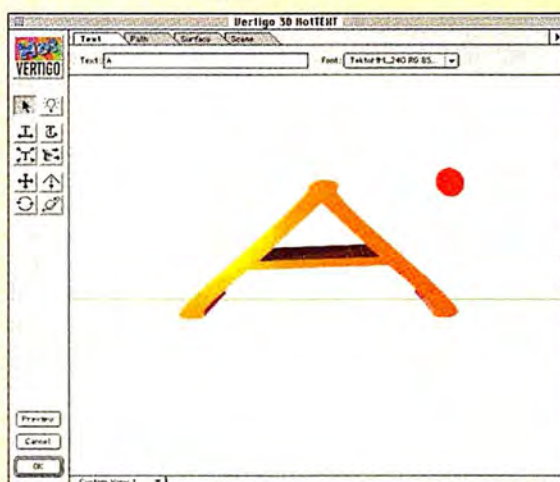
Vertigo's HotText plug-in helped Fenster quickly create the 3-D text that pops from the illustration above. Instead of taking time to use Adobe Dimensions as she usually does, she used HotText to make, manipulate, and illuminate the letterform within Photoshop (A). The live previews also made it easy to experiment with the letter until it closely followed the shape of a roof. "You can really go crazy in 3-D space," she says (although she wishes HotText didn't require a Power Mac).

Next, Fenster wanted to build a house with blocks of rich texture. Ordinarily she spends hours photographing natural objects to create her art's trademark look. This time she used scans of sketching paper only as the image's foundation. Then she chose a Hard Light blending mode and used Tectures to quickly create more-lavish rectangles of texture (B).

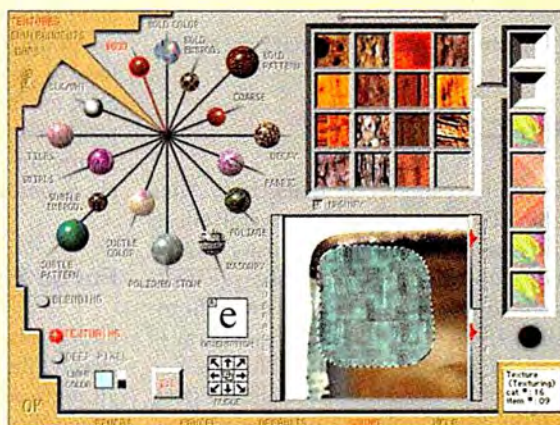
"Ninety-nine percent of the artwork I do is in Photoshop," Fenster says. "If something lives within Photoshop, there's a much better chance I'll use it than if it stands alone." HotText and Tectures are convenient and quick, she says, precisely for this reason—you don't have to leave the familiar confines of Photoshop to get what you want.—SCHOLLE SAWYER

Dimensional Dynamos

An expert delves
into Tectures and
HotText



(A) Vertigo's HotText



(B) Andromeda's Series 4, Tectures

Extensis PhotoTools 2.0

The original PhotoTools plug-in set was a strong mix of equal parts productivity program and special-effects package. Now, with PhotoTools 2.0, Extensis improves on this formula to make life in Photoshop even easier.

PhotoTools' much lauded type-handling filter was the first to let you combine multiple fonts and sizes inside a single text block and adjust kerning. Now you can save your text (for future editing) and even assemble style sheets. To further your creativity, the old package facilitated the construction of common effects such as beveled and embossed edges, glows, and drop shadows. PhotoTools 2.0 also helps you create buttons for Web pages and other multimedia projects, and it can cast perspective shadows.

All of these improvements are built on a foundation of efficiency-boosting tools, such as customizable button bars (like the ones you find in Microsoft Word) for one-click access to the commands you use most frequently.

Creative Catalysts

When you think filters, it's the effects filters and the zany artwork they can produce that come to mind first. Rarely the means to an end, these plug-ins are meant to excite creativity.

Eye Candy 3.0

Formerly called The Black Box, Alien Skin's Eye Candy is the best overall effects package on the market. In many ways, it takes up where the old Gallery Effects collection (now integrated into Photoshop 4) leaves off, offering a wide array of real-life emulations, such as Chrome, Fur, and Smoke. But unlike the Gallery Effects filters, Eye Candy's 21 plug-ins are uniformly handy, easy to predict, and extremely versatile.

The Fire filter, for example, is equally capable of making flames or swirling motion trails. Jiggle lets you both twirl and warp pixels from within a single dia-

log box. And the Squint filter produces a true optical blur that correctly emulates the effects of myopic vision, as I can attest from a lifetime of personal experience.

The interface remains quirky; too little space is devoted to the previews. I also wish that Alien Skin would stop raising the price (now more than twice its \$89 price of three years ago). However, this is one effects collection that has improved steadily over time.

PenTools 1.0.2

What do you do if you're a developer of innovative artists' tablets and the big graphics applications aren't taking full advantage of your hardware's wonderful capabilities? You write your own software, as Wacom has done. If you own a Wacom tablet, you can download the PenTools collection of six filters (soon to be eight) free of charge.

Each filter turns your pen into a new kind of editing tool. You can paint with noise, smooth over imperfections, or add chiseled grooves. My favorite is Super Putty (see the screen shot "Pen Power"), which provides Photoshop with a much needed distortion brush that actually moves pixels, as opposed to Photoshop's own smudge tool, which smears pixels.

The functions of the filters vary widely and exploit stylus functions such as tilt and erase. My biggest gripe is that there's no Undo; if you draw a wrong stroke, you have to erase back to the unfiltered image. Still, for free I can deal. (For links to this product as well as the other freeware and shareware tools mentioned in this article, check out www.macworld.com/more/.)

Furbo Filters 1.3

Craig Hockenberry's shareware set, Furbo Filters, includes only four filters in all, but one of these, Organic Edges, is extraordinary enough to carry the entire collection. Blessed with six rendering modes and a dizzying array of controls, this plug-in makes five or six of Photoshop's bundled filters obsolete. And this is the only filter I have seen with a Chrome setting that actually produces



Pen Power You too can use Wacom's free Super Putty filter with an ArtPad II tablet to radically adjust the colossal head of the late emperor Constantine! Each filter in the PenTools plug-in set turns your Wacom pen into a new kind of editing tool.

something vaguely resembling chrome.

Also included is a variation on the Emboss filter that does a better job of resolving engraved grooves at high settings, a psychedelic color remapper, and the obligatory synthetic-pattern generator. You can download the four Furbo Filters, complete with documentation, for free, but be warned that an ingenious

EDITORS' CHOICE

Creative Catalysts

★★★★ Eye Candy 3.0 Collection of 21 filters simulates a wide range of real-life effects.

Company: Alien Skin Software (919/832-4124, www.alienskin.com). **List Price:** \$199.

★★★★½ Furbo Filters 1.3 Inexpensive collection features one standout filter that renders realistic edge effects. **Author:** Craig Hockenberry (714/494-9464, www.furbo-filters.com). **List Price:** \$40 shareware fee.

★★★★ Greg's Factory Output, Volumes 1 & 2 Diverse collection of free plug-ins offers excellent effects at the best-possible price. **Author:** Greg Schorno (<http://mars.ark.com/~gschorno/gfo/>). **List Price:** Freeware.

★★★★ PenTools 1.0.2 Six free effects filters take special advantage of Wacom tablets and the abilities of the pen. **Company:** Wacom Technology (360/750-8882, www.wacom.com/pentools). **List Price:** Freeware (requires Wacom pressure-sensitive tablet).

copy-protection scheme gradually slows down performance if you neglect to submit the \$40 shareware fee.

Greg's Factory Output, Volumes 1 & 2

Most plug-ins are written by skilled programmers according to protocols outlined in Adobe's Software Developers Kit. But just plain folks can design their own plug-ins too, using the Filter Factory that ships with Photoshop.

In the past, I've generally ignored Filter Factory plug-ins, because of their inherent interface limitations. Then I happened to stumble across Greg's Factory Output. These two volumes comprise 21 imaginative and widely disparate filters by Greg Schorno, every one of them absolutely free.

Armed with these plug-ins, you can shatter an image into wedge fragments, trace the edges of your artwork with neon, create a series of gradient blocks, and shine a simple spotlight onto your image. The previews are often inaccurate, and you can modify settings only by dragging slider handles, but these shortcomings are the inescapable faults imposed by the Filter Factory. Bearing the programming environment in mind, Greg's Factory Output is nothing short of amazing.

3-D, Type, and Texture Tools

Digital artists spend much of their time in Photoshop attempting to fake reality. These plug-ins can help you fabricate forms with believable depth, volume, and surface texture.

HoloDozo 1.0

The easiest and fastest of the 3-D plug-ins comes from the German company M.M.M. Software. Designed exclusively for Power Macs, HoloDozo is a collection of 28 filters that conspire with Apple's QuickDraw 3D to wrap an image onto a sphere, cone, cylinder, doughnut, or other wacky shape.

EDITORS' CHOICE

3-D, Type, and Texture Tools

★★★★ Flaming Pear Filters First-rate quartet of shareware filters offers excellent beveling and dithering functions. **Company:** Flaming Pear Software (<http://ccn.cs.dal.ca/~aa731/blade.html>). **List Price:** \$35 shareware fee.

★★★★½ HoloDozo 1.0 Quickly and easily wraps images around 3-D surfaces. **Company:** M.M.M. Software (www.mmmsoft.com). **List Price:** \$149.

★★★★ HotText 1.0 The only plug-in that is able to create 3-D text along a curve. **Company:** Vertigo Technology (604/684-2113, www.vertigo3d.com). **List Price:** \$149.

★★★★½ Series 4, Techtures 1.0 (with Velociraptor) Hundreds of hand-drawn patterns and textures bundled with a bonus motion-trails filter. **Company:** Andromeda Software (805/379-4109, www.andromeda.com). **List Price:** \$120.

Each filter relies on a consistent set of whimsical controls that can light and squeeze the shape. Rotating the image in 3-D space is as simple as dragging it inside the real-time preview. The renderings are a wee bit jagged, so it helps to work at high resolutions. But the collection is so swift, simple, and affordable—with additional plug-ins included for Adobe Premiere and Macromedia Director—that it's virtually impossible to find fault with it.

HotText 1.0

Like HoloDozo, Vertigo's HotText requires a Power Mac equipped with QuickDraw 3D. But where HoloDozo focuses on 3-D shapes, HotText takes on fully rendered type. HotText brings up a separate working environment complete with toolbox and floating palette. Here you can adjust camera angles, add lights, rotate characters, and apply surface textures. You can even align your 3-D

characters to a free-form path, which is great for making type that rushes toward the viewer.

When compared with other 3-D-text plug-ins—particularly one of last year's top plug-ins, Xaos Tools' TypeCaster (\$199; 415/487-7000, www.xaostools.com)—HotText does come up short in some areas. In particular, HotText lacks TypeCaster's ability to bevel edges. But HotText offers a slick feature all its own—it's the *only* plug-in that delivers 3-D type that dips and curves on a path. If that's the sort of 3-D text you're itching to create, HotText will prove a worthy addition to your plug-in collection.

Series 4, Techtures 1.0 (with Velociraptor)

Andromeda's fourth Series collection, Techtures, is a new variety of texture-selection and -application software. It doesn't randomly generate mathematical patterns, as does KPT's Texture Explorer (part of Kai's Power Tools, \$129, from MetaCreations, 800/472-9025, www.metacreations.com), nor does it permit you to construct patterns of your own, as does MetaCreations' stand-alone TextureScape (\$50). Instead, Techtures pre-



Better Bevels The shareware Flaming Pear Filters stride the line between 3-D filters and Web tools. The Blade plug-in (top), for one, beats out a similar feature in both PhotoTools and Eye Candy to add exquisitely rendered beveled edges that would do any navigation button proud. Alternatively, the FeatherGIF filter (bottom) can surround your image with a soft dither pattern.

sents you with a collection of 900 hand-rendered patterns, each including custom highlight and shadow information.

You can create a simple blend of image and pattern or engrave the image with a full-blown surface map. If that's not enough, *Techtures* includes a few hundred scalable lighting effects and pixel-shifting displacement maps. I wish it let you import custom textures and that it didn't require you to first mount a CD-ROM, but it's just the ticket for adding paper textures and other surface effects.

Techtures is bundled with *Velociraptor*, which creates the widest array of unidirectional motion trails I've ever seen. The motion trails can run parallel, converge on a vanishing point, and even revolve in an expanding spiral. *Velociraptor* works best if you take the time to select a particular element, but you can still achieve decent effects even if you haven't. *Velociraptor* is so good that it runs the risk of outshining the main event, *Techtures*.

Flaming Pear Filters

Programmer Lloyd Burchill's eclectic quartet of Flaming Pear Filters spans two of our four categories. *Blade 1.5.5* is a 3-D-beveling filter that offers more flexibility and better rendering than either *PhotoTools* or *Eye Candy* (see the screen shots "Better Bevels"). *Tessellation 1.1* transforms any image into a seamless rectangular tile pattern, great for building repeating backgrounds. *India Ink 1.3* halftones grayscale images, using one of 16 unusual patterns, just the thing for preparing dynamic black-and-white images for the Web. And *FeatherGIF 1.8* blurs the edges of an image by applying a fading dither.

Tessellation badly needs a preview, and as this story went to press, it still was not possible to download the plug-ins efficiently as a group. But the rest of the set is of such superior quality that you'd be a cad not to pay the immensely reasonable \$35 shareware fee. To sweeten the deal, Burchill offers two additional freeware plug-ins: *Vitriol* and *Color Swap*. The former filters colors as when photographing through a colored glass; the latter swaps the contents of two specified color channels. You can search for either one at <http://hyperarchive.ics.mit.edu/HyperArchive.html>.

Web Imagery Aids

It's easy enough to get images onto the Web, but it's harder to make them look good. These tools make mincemeat of file size while maintaining a measure of quality.

PhotoGIF 2.1/

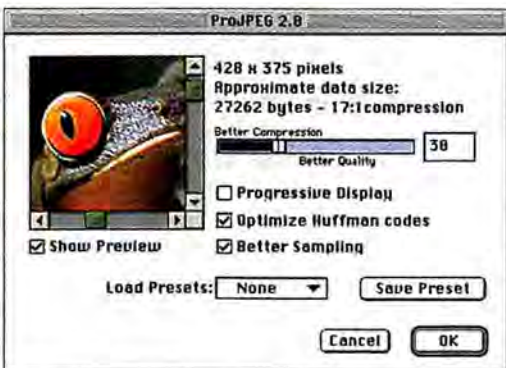
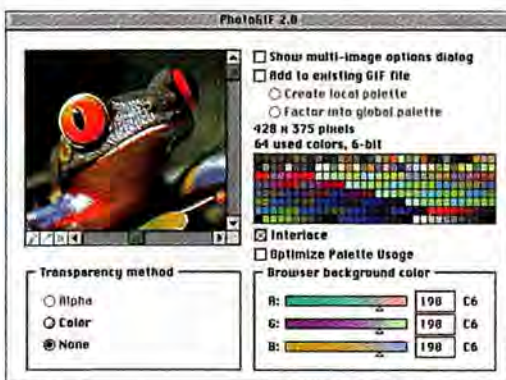
ProJPEG 2.0 Bundle

Photoshop's own GIF and JPEG export modules aren't bad, but recent third-party replacements—*PhotoGIF* and *ProJPEG*, from *BoxTop Software*, and *HVS WebFocus*, from *Digital Frontiers*—suggest that there's ample room for improvement.

BoxTop's PhotoGIF filter intelligently reduces the number of colors in an image to produce an effect superior to that of Photoshop's Indexed Color com-

mand. You also have better control over dithering, which mixes pixels to offset the loss in colors but can sometimes give images an unattractive spotty look. Instead of simply turning dithering on or off, as Photoshop lets you do, *PhotoGIF* lets you adjust the dithering incrementally, thereby softening edges without speckling flat areas of color.

After you reduce the colors, *PhotoGIF* previews the image in a second dialog box. Unfortunately, if you don't like what you see, you have to click on *Cancel* and start all over again. Thankfully, *PhotoGIF's* companion, *ProJPEG*, offers a preview that updates when you change settings. *ProJPEG* even estimates the size of the final data fork and lets you tweak the compression with a convenient slider (see the screen shots "Size Matters"). To top it off, you can even save settings for later use, adjust defaults, and add frames to animated GIF files. All this control comes at a bargain price—\$70 for the two bundled together. If you spend much time designing for the Web, you can hardly afford *not* to buy these proficient plug-ins.



Size Matters *BoxTop Software's* Web-savvy plug-ins, *PhotoGIF* (top) and *ProJPEG* (bottom), let you preview the effects of bandwidth-saving color changes and compression settings before saving an image. *ProJPEG* also lets you use a handy slider to adjust how big the saved file will be.

HVS WebFocus 2.11

Like the *BoxTop* duet, *Digital Frontiers's* *HVS WebFocus* includes GIF and JPEG modules, called *HVS ColorGIF* and *HVS JPEG*, respectively. *HVS ColorGIF* is indisputably more capable than its *BoxTop* equivalent. *ColorGIF* lets you adjust threshold and gamma settings to prepare images for display on PC monitors. You can establish settings and preview the results inside a single dialog box. And after the preview completes, *ColorGIF* estimates how big the data fork will be.

HVS JPEG offers a larger preview than *BoxTop's ProJPEG* but is otherwise roughly equivalent, with a more haphazard interface. For example, the dialog box starts off with an option that blurs edge detail in the name of better compression, generally a rotten trade-off.

Even though *HVS WebFocus* offers better GIF tools than the *BoxTop* bundle, I have to come down in favor of the



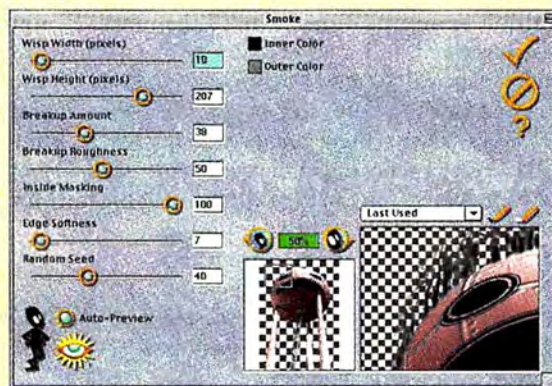
WHEN WE TURNED LONGTIME MACWORLD CONTRIBUTOR John Hersey loose with Extensis PhotoTools and Alien Skin's Eye Candy, he discovered that (for better or for worse) these tools inspired him to experiment with effects he hadn't imagined before.

Hersey took one look at Eye Candy's Fire filter and decided to make his tower illustration burst into flames. "It's always fun to make things smoke and burn," he says. He duplicated his illustration on a separate layer and fiddled with the filter's settings until smoke spiraled up the ladder and billowed from the tower's head (A). After satisfying his pyromaniac urges, Hersey realized he could use PhotoTools' PhotoGlow plug-in to make more than just a fuzzy glow. He deselected the Create Glow Only option and changed Radiance to 0 percent. The result was the "vibrating, aura kind of things" that radiate from the tower (B).

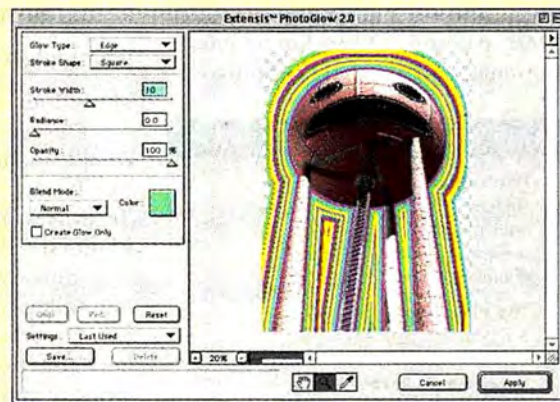
Hersey found the plug-ins' RAM demands taxing on his system, but despite that inconvenience, he thinks that when used wisely, Eye Candy's and PhotoTools' effects can take your art in whole new directions, as well as just be fun. "If you get too swept up by weird effects, they distract from the image," he says, "but at times those effects can add a lot of drama."—SCHOLLE SAWYER

Eye-Catching Inspirations

A pro gets fired up with PhotoTools and Eye Candy



(A) Alien Skin's Eye Candy



(B) Extensis PhotoTools

BoxTop tools for economic reasons—at \$159, HVS WebFocus costs more than twice as much as its competitor. If you're willing to pay for the best of both worlds, you can purchase HVS ColorGIF separately for \$99 and BoxTop's ProJPEG for \$35. That's still \$64 more than PhotoGIF and ProJPEG together, but for some people, HVS ColorGIF's superior previews alone may be worth it.

DitherBox 1.0.5

If most of the folks who visit your Web site spend their time staring at 8-bit monitors, then you probably live and die by the 216-color platform-independent Web palette. The problem is, having only 216 colors is extremely limiting, even when you're producing GIF graphics. So wouldn't it be great if you could blend Web-safe colors to produce a million or so variations? That's the question asked and answered by two nearly identical plug-ins from RDG Tools and BoxTop Software.

RDG's DitherBox converts any RGB color to a repeating pattern of two Web-safe colors. You can then apply this pattern to any selection or layer inside your image, much as if you were using Photoshop's Fill command. DitherBox can't convert a photograph to Web-safe patterns—Photoshop already does this automatically—and you can't apply more than one pattern at a time. But you are able to make as many patterns as you like, enhance your patterns by painting in them, and assemble your own custom pattern palettes. DitherBox is cheap, functional, and altogether intuitive to

the most casual observer; in other words, it's what every plug-in should be.

ColorSafe 1.1.1

Expert users will be interested in DitherBox's slightly more developed twin, BoxTop's new ColorSafe. You rarely see this kind of resemblance—identical buttons with identical names appear in identical locations. Still, if you look hard, you can find differences, all in ColorSafe's favor.

First, ColorSafe includes sliders for red, green, and blue, so you can define colors without visiting a second dialog box. Second, ColorSafe offers a bunch of custom palettes in addition to the standard 216-color one. Third, ColorSafe comes with a SimpleText FAQ sheet; the only DitherBox documentation is online.

Are these few extra features worth an additional \$20? For most people, the answer is probably no. However, if your work demands the extra control ColorSafe offers, it's well worth the expense. Plus, if you're already planning to purchase PhotoGIF and ProJPEG, you'll save \$11 by buying the three bundled together for \$109.

EDITORS' CHOICE

Web Imagery Aids

★★★★ ColorSafe 1.1.1 Expertly blends the 216 colors of the browser-safe palette to create millions of variations. **Company:** BoxTop Software (601/323-6436, www.boxtopsoft.com). **List Price:** \$50.

★★★★ DitherBox 1.0.5 Doesn't offer all the color-creation features that ColorSafe does but costs less. **Company:** RDG Tools (800/451-3353, www.ditherbox.com). **List Price:** \$30.

★★★★½ HVS WebFocus 2.11 Superior previewing of GIF color indexing comes at a price. **Company:** Digital Frontiers (847/328-0880, www.digfrontiers.com). **List Price:** \$159.

★★★★ PhotoGIF 2.1/ProJPEG 2.0 Bundle Gives you fine control over color reduction and file size of GIF and JPEG images at a reasonable price. **Company:** BoxTop Software (601/323-6436, www.boxtopsoft.com). **List Price:** \$70.

Macworld's Buying Advice

Even though this is a bumper crop of plug-ins, you probably don't need them all. My advice is to take a good look at your budget and then select from each of the four categories.

This year's plug-in Dream Team would include Extensis Mask Pro; Eye Candy, from Alien Skin; Series 4, Techtures, from Andromeda; and the PhotoGIF/ProJPEG Bundle, from BoxTop Software. I have awarded some other plug-ins higher ratings, but these four have the advantage of blending the best functionality with the broadest range of applications.

The problem with the Dream Team is that its total cost is almost \$700, more than the street price for Photoshop. So for you thrifty folks, there's the Budget Team: Extensis PhotoTools, Wacom's PenTools, the Flaming Pear Filters, and RDG Tools' DitherBox. Every one is at

least a four-mouse program, and together they'll cost just shy of \$200. Of course, PenTools requires a Wacom tablet, but if you've been listening to me throughout the years, you already own one of those by now (if not, it may be time to put this on your wish list).

Finally, if I had to pick one plug-in that stands a chance of actually changing the way imaging professionals work, the only contender would be Altamira's Genuine Fractals. By fundamentally altering the way Photoshop writes images to disk, Genuine Fractals makes a plausible case for *never* working with images larger than 25MB. And at \$159, this is the rare professional tool that doesn't gouge your pocketbook. ■

Contributing editor DEKE McCLELLAND is the author of *Macworld Photoshop 4 Bible* and *Photoshop 4 Studio Secrets* as well as the upcoming *Web Design Studio Secrets* (all from IDG Books Worldwide).

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Secrets

An Office of Your Own

CUSTOM-FIT CLARISWORKS TO YOUR ALL-IN-ONE OFFICE NEEDS

by Joseph Schorr

ClarissWorks isn't just another productivity application; it's the definitive Macintosh program. Simple, fast, uncluttered, powerful—it embodies everything you're supposed to like about using a Macintosh. Granted, most people don't think of ClarissWorks as a power user's tool. But with the release of ClarissWorks Office 5.0, this combination word processor–spreadsheet–database–graphics–communications application has gained some impressive new features—and a few new secrets that make it even more powerful and easier to customize for your own working style.

Tending the Bar

ClarissWorks 5.0 now sports full-fledged Microsoft-style button bars—a mixed blessing. Buttons make some commands easy to access, but that dizzying matrix of tiny gray buttons can be a space-hogging distraction. Fortunately, you can customize these button bars.

- Hold down the \mathbb{A} and option keys while clicking on a button to drag it to a new location on the button bar.

- \mathbb{A} -option-drag a button off the bar to remove it. Pare down each default button bar to display only those buttons you really use (see “Button Disposal”).

- Because ClarissWorks can display only one button bar at a time, it makes even more sense to create your own but-



ton bar containing your choice of buttons from the standard bars. To create a new bar, choose New Button Bar from the pop-up menu marked with the large black triangle on the button bar itself. In the New Button Bar window, you can double-click on a button to add it to your custom bar. You can also shift-click on multiple buttons and then click on the Add button to install several new buttons on the bar at once.

Who Needs F-Keys?

Generally, when you record a ClarissWorks macro, you link it to a keyboard

shortcut so you can trigger the macro by using only a single keystroke. But there are 13 ClarissWorks macros you can define that require no keystrokes at all; they happen automatically when you launch the program and when you open or create new documents.

These automatic macros can be huge time-savers. For example, suppose that 80 percent of the time you launch ClarissWorks, your next step is to create a new word processor document. You can record a macro that automatically creates a new word processor document for

continues

Safe but Not Secure

FOR THE FIRST TIME, CLARISWORKS 5.0 ALLOWS YOU TO PASSWORD-protect individual documents, but if you're not looking for it, you might miss the password-protection feature completely. To add a password, choose Document Summary from the File menu and then click on the Set Password button. After you enter and confirm the password, your document won't open without the correct password.

Now the warning: This password protection can keep your four-year-old from tampering with your business spreadsheets, but it is hardly a foolproof approach to document security. Claris has padlocked the front door—but left the back door wide open.

Because this password-protection scheme doesn't use encryption, breaking past the password isn't difficult. You can easily force a ClarisWorks word processor document open, for example, with Microsoft Word 6.0 (choose Word's Open command and change File Type to All Files). Utilities such as ResEdit and CanOpener also make quick work of cracking into a locked file. (The latter two programs can also extract pictures from a password-protected ClarisWorks drawing.)

Of course this rather lax approach to document security can work in your favor, too. If you forget your password and absolutely must retrieve an essential piece of data, you can do it.

you, switches the button bar to a custom bar you defined, opens the appropriate library, and sets preferences the way you like them—all as soon as you launch ClarisWorks.

The secret is to record all the steps outlined above in one macro called Auto-Startup. ClarisWorks recognizes the Auto-Startup macro by its name (capitalization counts) and runs it every time you launch the program. Likewise, a macro called Auto-New DR—again, spacing and capitalization must be exact—will run by itself every time you create a new draw document, and a macro called Auto-Open SS will trigger itself whenever you open an existing spreadsheet. Check out the ClarisWorks QuickHelp documentation under "macros" for a complete list of the 13 self-triggering macros you can write.

A Texture of Your Own

ClarisWorks' new Textures palette allows you to apply one of 20 different textures to an object and allows you to paint using one of the textures as a paint color. What's less obvious is that you can create your own textures and save them permanently.

To design your own texture, first select a portion of an existing image and copy it to the Clipboard (ideally, your selection should be 64 by 64 pixels, the maximum size of a ClarisWorks texture). You can use a picture from the Scrapbook, a portion of a scanned image, or even a

your custom textures permanently, you have to save them immediately, using the Preferences command. After creating a set of new textures, choose Preferences from the Edit menu and change the Topics pop-up menu to Palettes. Click on the Textures radio button, and then click on the Save button in order to name and save your textures.

In the future, you'll be able to access your custom textures simply by returning to Preferences and clicking on the Load button. Clicking on the Make Default button after you've loaded your textures turns your custom textures into the ClarisWorks default.

By the way, if you'd rather not venture up to the Edit menu each time you have to access the Preferences screen, you can just option-click on the page-number field at the lower left edge of any ClarisWorks window to go directly into the document's preferences. **m**



Button Disposal Maintain ClarisWorks' lean, uncluttered look with a little bit of button-bar cleanup. ⌘-option-dragging buttons off the button bar removes them permanently.

picture you've created within ClarisWorks itself using the painting tools.

Next, tear off the Textures palette from the ClarisWorks Toolbox and double-click on one of the existing textures to open the Texture Editor. Now choose Paste to turn your copied image into a texture (see "Grab a Texture").

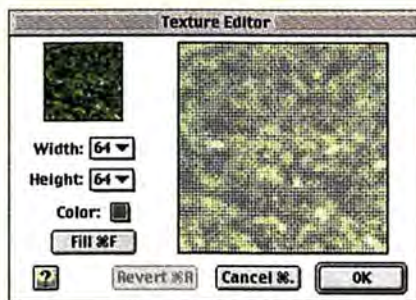
Your custom texture will vanish as soon as you close the current document—or even if you move the document to the background. In order to save

Grab a Texture

HOW TO ADD A NEW TEXTURE TO THE CLARISWORKS TEXTURES PALETTE



1. Open an image and select a 64-by-64-pixel section you want to turn into a texture. Double-click on one of the texture swatches on the Textures palette.



2. After you've done that, paste the selection into the Texture Editor window.



3. Once you've added a new texture, you can use it to fill and paint other objects in your document.

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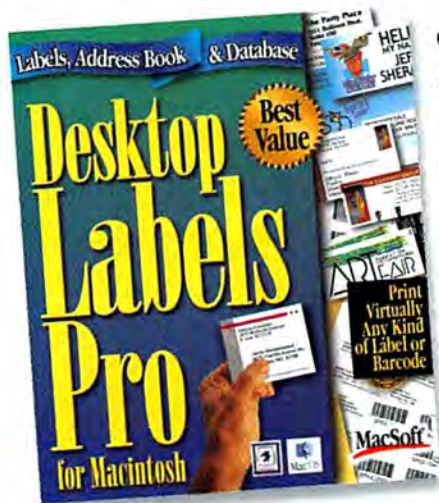
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Tips, Tricks, and Shortcuts

by Lon Poole

If you access the Internet from multiple computers, you probably find it impossible to keep track of all your bookmarks. *Macworld* reader Dartmore Howell suggests that you consider storing them on a Web page so that you are able to access them from any machine.

Bookmarks are kept in an HTML file. If you use Netscape Communicator or Navigator, the file is called Bookmarks.html and is in the Netscape folder inside your System Folder's Preferences folder. If you use Microsoft Internet Explorer, the file is called Favorites.html and is in the Explorer folder inside the Preferences folder.

You can duplicate your bookmarks file and upload the duplicate to your Web space with an FTP application, such as the \$10 shareware Anarchie, from Stairways Software (www.stairways.com/stairways/). (If you're not sure how to access your Web space, ask your Internet service provider.)

If you use Navigator 3.0 for e-mail, you can also add e-mail addresses to the bookmarks on your Web page. Make a copy of both the AddressBook.html file and the Bookmarks.html file (they're in the same folder), and then open the copies with a text editor, such as SimpleText or Bare Bones Software's freeware BBEdit Lite. Copy and paste or drag everything from the AddressBook.html window to the bottom of the Bookmarks.html window. Save the newly combined file, and upload it to your Web space.

Once you've uploaded the file, you can access your bookmarks page from any Web browser on any machine. The URL for this page ends with the name of the

file you upload. For example, www.isp.com/~mylogin/bookmarks.html. (If you named the uploaded file index.html, you don't need to include the filename at the end of the URL.)

Keep in mind that other people on the Internet can access your bookmarks (and e-mail addresses, if you include them) if they know the URL or happen to find it through one of the Web search services. You may want to edit the file with a text editor to remove confiden-



tial information before uploading it. Since it's a duplicate of the original bookmarks file, you can ignore warning messages about editing it.

603e Replacements

Q If I have a Mac with an upgradable 603e (such as a Umax SuperMac C500), can I replace the processor with a 604e, Mach 5, or G3 processor, or will I always be limited to a 603e?

STEVE TRUEMPER
St. Louis, Missouri

A If I were a betting man, I'd lay odds that people who own 603e-based machines such as Umax's SuperMac C500 or C600 or Power Computing's PowerBase models aren't going to be able to upgrade their processors. All of these computers have motherboards that are based on the Alchemy design, and the ROMs simply will not work with a 604e CPU, including the improved 604e (code-named Mach 5).

The PowerPC 750 (code-named G3) is a slightly different story. Umax says the C500 and C600 could take a 750 processor, because its design is a derivative of the 603e's design. The trouble is, no one is making a C500-compatible CPU card with a 750 on it. I may have to eat my words someday, but I doubt that anyone is ever going to make a 750 upgrade card for those clones' modified Alchemy motherboards.

Missing OS Component

Q My new 9600 didn't come with a TCP/IP file. I was told TCP/IP had been replaced with something else and that I shouldn't load it. What are the facts?

DAVID T. SEAFORD
Lincolnton, North Carolina

A Your 9600 should have a TCP/IP control panel, and you can use it to set up a TCP/IP network connection. (The TCP/IP control panel replaces the MacTCP control panel found on some older Macs.)

If the TCP/IP control panel is missing, reinstall the networking component

of the system software from the CD-ROM that came with the computer. If you have an installation CD for a newer version of the Mac OS, use that instead.

To install a single component of System 7.6 or later, start the Mac OS Install program on the CD and go through the four steps. In the fourth step, click the Customize button and select the Mac OS module for installation. Click the Start button to begin installation.

The Mac OS Install program then gives control to a subordinate Installer program for the Mac OS module. In the Installer's main window, choose Custom Install from the pop-up menu. The Installer then lists components you can install selectively. Select the Networking & Connectivity component, and click the Install button.

For more information on setting up your Mac for the Internet or networks in general, consult the on-screen Mac OS Guide (called Mac OS Help in OS 8) topics "Networks" and "Connecting to the Internet." You can access on-screen help by choosing Mac OS Guide from the Guide menu (the question-mark menu next to the Finder menu) or, if you have Mac OS 8, by choosing Help from the Help menu. One of these menu choices is available when the Finder is active (click the Desktop to make it active).

Monitor Black Hole

Q For years I've been trying to disable the additional monitor port on my Power Mac 7100/66 AV, hoping to alleviate my "disappearing cursor" problem. The cursor constantly travels over the edge of my screen into the black hole of the nonexistent second monitor and disappears. It's a pain; can you help?

GEORGE BROZE
St. Louis, Missouri

A If you have a Power Mac 6100, 7100, or 8100 with two video ports but have only one monitor, connect the monitor to the video port on the AV card or video card—not the video port on the system board. If there is no monitor connected to the system-board video port, the Mac OS won't create a screen image for a second monitor (undisplayed in our case, since there is no second monitor to display it) and the pointer can't go past the edge of your single screen.

Look, C

Q What is a good book for learning C on the Mac?

MIKE GONNASON
Anchorage, Alaska

A It depends on how serious you are. If you just want to dabble in Mac programming, I suggest *Mac Programming for Dummies*, second edition (IDG Books, 1996), by Dan Park Sydow. It covers the basics of C and creating Mac applications and comes with Metrowerks' CodeWarrior Lite programming environment. But the book doesn't cover either subject in depth.

If you've made up your mind to learn C in depth, get *Learn C on the Macintosh*, second edition (Addison-Wesley, 1995), by Dave Mark. With this book, you'll master the C language even if you have no previous programming experience.

The book comes with Metrowerks' CodeWarrior Lite; conversely, Metrowerks includes the book on disk in its \$79 Discover Programming package, which includes a more complete version of CodeWarrior. CodeWarrior Lite creates only 680X0 applications, which run in emulation on Power Macs; the full-blown \$599 CodeWarrior Professional creates both 680X0 and PowerPC-native apps.

Apple's MPW development environment also creates both 680X0 and PowerPC-native applications. MPW is not as well regarded as CodeWarrior, but it's available for free on the Internet (<http://devworld.apple.com/dev/tools/tools.shtml>) and free on CD-ROM to registered developers.

Once you've mastered C, you'll need to learn how to create applications with a Mac look and feel. *Macintosh C* (self-published, 1997), by K.J. Bricknell, is a fabulous guide for this and will teach you everything you need to know to create serious Mac applications, assuming you already know C. This 800-page book is free, but it's available only on the Internet (www.AmbrosiaSW.com/alt.sources.mac/macintosh-c/) as linked Web pages or downloadable Word 6 and PDF files.

Fixing a Mac OS 8 Slowdown

TIP After I installed Mac OS 8 on a Performa 6200 with 16MB of RAM, the whole system slowed down

dramatically. Just opening a folder took 10 to 15 seconds. I added 32MB of RAM, but to my surprise, it didn't speed up performance. A couple of extremely frustrating weeks later, I tried to fix the problem by experimenting with my many extensions and control panels. For some reason, disabling the General Controls control panel cured this slowdown.

ANONYMOUS
via Macworld Online

Try reenabling the General Controls control panel and turning off the "Protect System Folder" and "Protect Applications folder" options. These options are known to slow down Mac OS 8. Folders may also open slowly if the disk cache is set too low. This can affect any version of the Mac OS, but Mac OS 8 seems especially susceptible. If your disk cache is only 96K, try increasing it to approximately 32K per megabyte of physical RAM (for example, 1,024K on a 32MB machine). You can set the disk cache to the suggested minimum size for your amount of RAM by clicking the Default button in the Memory control panel. After clicking this button, you may want to restore the settings of other Memory-control-panel options that were not set to default values.—LP

Previewing Your Web Page

TIP Instead of switching my monitor's resolution from 1,024 by 768 pixels to 640 by 480 pixels to preview how my Web-page layouts will look on smaller monitors, I've created a desktop picture for use with Mac OS 8. The picture is a 1,024-by-768 PICT, with a box drawn in the upper left corner that's the size of a 640-by-480 screen. Now, when I want to see what a layout will look like on a 14-inch monitor, I just shrink the browser window to fit the box.

GLEN KEUNE
St. Louis, Missouri

Copy Fonts without Quitting

TIP Collecting files for sending to a service bureau used to drive me crazy. I would have to quit QuarkXPress, Adobe Photoshop, and all other open applications to copy fonts from my System folder to a removable disk. Then I discovered that simply holding down the option key while dragging fonts from the

continues



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Fonts folder bypasses the problem. The fonts get copied, and it's not necessary to quit any open applications.

JOSH NORMAN
Seguin, Texas

Mac OS 8 is smart enough to copy fonts from the Fonts folder to another disk while applications are open, even if you don't hold down the option key.—LP

Managing Your Windows

TIP Here's a quick way in Mac OS 8 to close all Finder windows except one, without using an AppleScript script: First, drag the window you want kept open to the bottom of the screen to make it a pop-up window. Next, close all remaining open windows by option-clicking the close box of any one of them or by pressing ⌘-option-W. Finally, drag the pop-up window back to the middle of the screen to make it a regular window once more. You're done, and your desktop is neat and clean!

JAMES P. BURKE
Somerset, Massachusetts



Switch to See HTML To view the source HTML for a frameset you're working on in Adobe PageMill, add a text editor, such as SimpleText or Bare Bones Software's freeware BBEdit, to the Switch To section of PageMill's Preferences dialog box. Then you can see the frameset's HTML by choosing the text editor from the Switch To submenu of PageMill's Window menu.

Viewing HTML for a Frameset

TIP If you create frames in Adobe PageMill 2.0, you can't use the HTML Source command on the Edit menu to look at the HTML code for the whole frameset; PageMill can show the HTML source only for individual frames. To see the HTML for a frameset, you have to open its file with a word processor or text editor, such as Microsoft Word or SimpleText.

You can do this quickly by choosing the application from the Switch To submenu of PageMill's Window menu. If you choose an undemanding application such as SimpleText, the switch is very fast (almost seamless). You can add applications to the Switch To submenu with PageMill's Preferences command (see "Switch to See HTML").

NIC PAGET-CLARKE
via Macworld Online

BBEdit Lite displays HTML code in a structured format that's easier to read than SimpleText's unformatted display.—LP

Sync a PalmPilot and a 68030 Mac

TIP The MacPack software you use to synchronize a 3Com PalmPilot with a Macintosh officially requires a 68040 or PowerPC CPU, but you can synchronize it with a 68030 Mac.

1. Turn on your Pilot, and open its HotSync control panel.
2. Hold down both the Up and Down scroll buttons, and tap in the upper right corner of the screen until you see a window that says "DLServer WaitForever Is On." Then Tap OK.
3. Put the Pilot in its cradle, and press its HotSync button to begin the synchronization process.

ALLEN KWAN
Orinda, California

3Com says that the PalmPilot remains in "WaitForever" mode until the HotSync finishes, you cancel the HotSync, or the PalmPilot shuts itself off according to the Auto-off Preference setting.—LP

Copying FileMaker Pro Field Formats

TIP Lorraine Fiamengo, of Healdsburg, California, wants to remind Claris FileMaker Pro users that there are alternatives to the method presented in the November 1997 Quick Tips for applying the format of an existing field to fields newly added to a layout.

You can hold down the option key and drag a duplicate of an existing field to a new place on the layout. If you want to keep the duplicate field aligned vertically or horizontally with the original field, press shift and option while you drag the new field. When you release the mouse

button, FileMaker Pro displays a dialog box that lets you change the duplicate to a different field value.

You can also copy field formats by using Copy and Paste. After pasting a copy of a field, double-click it to bring up the dialog box for specifying a field.

These methods copy all formatting from the existing field. The method presented last November (pressing the ⌘ key while selecting the original field and then dragging another field to the layout from the field tool) intentionally doesn't replicate field size or style (such as pop-up menu) or button attributes.

Personalized Netscape Guide Menu

TIP If you hold down the Guide button in Netscape Communicator/Navigator 4.0's navigation tool bar, a menu pops up listing several preset links to places on the Netscape Web site. This is a better trick if you personalize the Guide pop-up by adding links of your own to it. You could probably customize the Guide pop-up with ResEdit, but it's simpler to use Skylar Stein's \$5 shareware Navigator Button Editor version 1.3.2 or later. This utility lets you list up to 100 links to Web pages, FTP sites, or newsgroups in the Guide pop-up. To keep the pop-up manageable, you'll want to limit it to a couple dozen links. You can add a divider line by creating a new item and typing a hyphen in its name box. Navigator Button Editor can also change the six directory buttons that Navigator 1.1N through 3.01 display. ■

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Mac OS 8 Bible* (IDG Books Worldwide, 1997).

Shareware mentioned in *Quick Tips* is available from Macworld Online (www.macworld.com) or America Online (keyword Macworld; use keyword Apple for Apple software).

We pay \$25 to \$100 for tips on how to use Macs, peripherals, or software. Please include your full name and address, so that we can send you your payment. Send questions or tips to quicktips@macworld.com or to Macworld Quick Tips, 501 Second St., San Francisco, CA 94107. All published submissions become the sole property of *Macworld*. Due to the high volume of mail received, we cannot provide personal responses.

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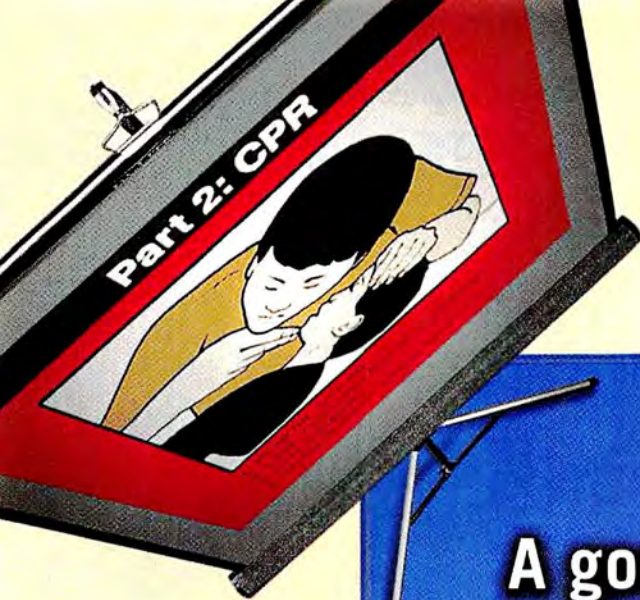
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Circle 15 on reader service card



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Circle 16 on reader service card

The Great and Mysterious Alpha Channel Explained

The Practical Theory behind Using Mask Channels in Photoshop

by Deke McClelland

Adobe Photoshop's selection tools have long ranked among the program's most attractive features. Armed with marquee, lasso, or magic wand, you can isolate a specific element inside a photograph. After that, it's up to you. You can sharpen the element, colorize it, apply a special effect, or even copy it and paste it against a different background.

But what many designers and digital photographers don't know is that the magic wand and friends represent only the most basic introduction to Photoshop's selection capabilities. Even if you manage to decipher every command under the Select menu, you'll have missed fully half of what the program has to offer—and it's the best half, too.

The name assigned to this group of secret selectors is *masks*. Technically little more than a subset of Photoshop's color channels, masks are more precise than the standard selection tools and every bit as intricate and powerful as Photoshop itself. They permit you to accurately identify elements that seem impossible to select—unevenly focused outlines; intricate chain-link fences or lattices; and the holy grail of edge details, hair.

In this quick introduction to masking, I explain what channels are; show you how and why you might save selections as channels; and examine the dynamic relationship between selection outlines, alpha channels, and the Quick Mask mode. Once you become familiar with the basics, try the step-by-step lesson in "Mask Anything in 20 Minutes or

Less." Masks may seem counterintuitive at first, but once you get a feel for how they work, everything else in Photoshop starts making a whole lot more sense.

Color Channels versus Alpha Channels

We typically regard Photoshop as a full-color image editor. But to Photoshop, the world is almost entirely gray. The program sees color images—RGB, CMYK, or otherwise—not as a single pane containing many colors but as a collection of gray-scale images, each containing 256 brightness values (ranging from 0 for black to 255 for white). These gray-scale

images are called *color channels*.

A gray-scale image contains just one channel, Black. An RGB image contains three channels (Red, Green, and Blue), and a CMYK image contains four (Cyan, Magenta, Yellow, and Black). You can access each channel independently from the Channels palette, or you can view them all together as a full-color image (see "Switching Channels").

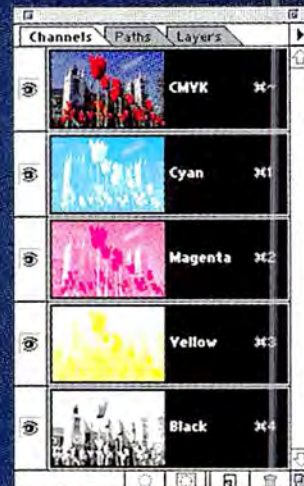
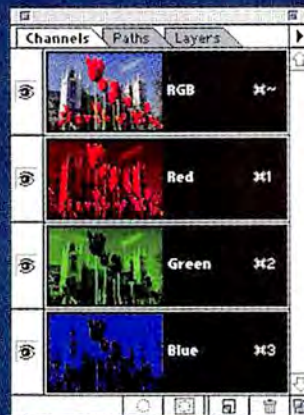
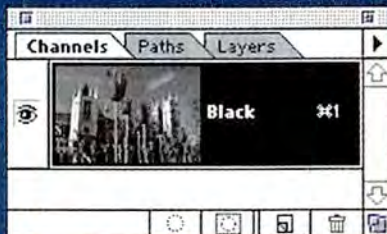
To generate the color image that you see on screen, Photoshop projects the gray-scale data in each color channel through a virtual color filter. In an RGB image, for example, Photoshop merges *continues*



Switching Channels

Photoshop's Channels palette handles up to 24 channels (each is a gray-scale image with 256 brightness values), but the program needs, at most, just 4 to represent any image. A gray-scale image takes 1 channel (Black), an RGB image takes 3 channels (one each for Red, Green, and Blue), and CMYK takes 4 (Cyan, Magenta, Yellow, and Black).

These color-bearing channels contain the data that makes up the image. Don't mess with them unless you want to change the image itself.



the contents of the Red, Green, and Blue channels into a color composite.

Photoshop can express any photograph in 4 or fewer channels, but the Channels palette can accommodate up to 24. If you add a channel to an image and paint inside it, Photoshop treats that channel as a completely separate gray-scale image. Such an extra, non-color-bearing channel is sometimes called an *alpha channel*, which is just a way of saying that it has no specific purpose. The most common use for an alpha channel is to store and modify complex selection outlines, which is why I prefer to call it a *mask channel*.

Saving and Retrieving Selections

The fact that Photoshop views the world through gray-scale glasses has implications for the way you make selections. Although you don't see it, when you use the selection tools, Photoshop evaluates the degree to which every pixel in your image is selected and gives it a value on a sliding scale from 0 (not selected) to 255 (fully selected). Sound familiar? Yup, that's the same sliding scale of values Photoshop assigns to each gray-scale image that makes up a channel. Photoshop is actually calculating a selection outline as an 8-bit, gray-scale image.

Selection outlines are fragile creatures. As you add and subtract pixels, Photoshop thoughtfully gives you the option of undoing one mistake, but no more. Imagine that after finessing a selection for ten minutes, you accidentally click and deselect it. If you were to freak out and click once more, you'd lose both your single undo and ten minutes of your life.

Thankfully, you can save a selection at any point in time. Just click in the dotted circle-in-a-rectangle at the bottom of the Channels palette. The selection remains intact; Photoshop duplicates it to a mask channel and assigns it

Mask Anything in 20 Minutes or Less

Everything you need is in the image itself

There are many ways to create a successful mask in Photoshop. You can paint the mask from scratch; automate the process with color-adjustment commands; or rely entirely on channel operations, never touching a brush. My favorite technique combines a modicum of automation with some manual labor and a straightforward approach.

While many masking techniques work great on certain kinds of images with certain effects, this one works on almost any image. To prove it, I've chosen a formidable example. This lion, from the Digital Stock image library (760/634-6500, www.digitalstock.com), sports a highly articulated mane as well as eyebrow and chin hairs. Not only that, he's resting against a grassy background that has a color value very similar to his fur's. The challenge is to select this lion—chin hairs and all—and set him against the background of your choosing. If all you had were the lasso and magic wand, you wouldn't stand a chance. In this case, masking is not an option; it's the only solution.

The first time you run through these steps, you may take more than 20 minutes to complete a satisfactory mask. But with practice, you can get it down to a quick and dependable drill.



Red Channel



Green Channel



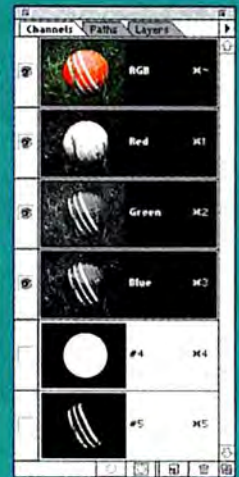
Blue Channel

1 Use one color channel as a basis for your mask
Your first task is to decide which channel provides the best natural contrast between the image you want to select and its background. (To peruse the color channels, press ⌘-1, ⌘-2, ⌘-3.) In an RGB image, the green channel is often your best bet because it carries much of the brightness and contrast information.



Croquet en Masque

To save a selection, click on the dotted-circle icon at the bottom of the Channels palette. Photoshop automatically converts the selection to a mask. An RGB image can hold up to 21 such masks.



the next unused number—#4 is the first available channel in an RGB image (see “Croquet en Masque”). If you click on that new channel in the Channels palette, you’ll see that the selected area appears white and everything outside the selection is black (you can change that, but for this article we’ll assume the default setup). Although it looks very different from the traditional marching-ants view of a selection, the white-on-black mask is functionally identical.

At this point, you can deselect the image, modify the selection, or apply any edits that you please, secure in the knowledge that your saved selection is

safe and sound. To retrieve your saved selection outline, press the ⌘ key and click on the mask name in the Channels palette. Alternatively, you can press ⌘-option-4, or grab the mask layer and drag it to the load-selection icon (the small dotted circle).

Photoshop automatically saves extra mask channels along with your image, provided that you choose the proper file format. The PICT format stores up to four channels, so you can save an RGB image with one mask. GIF can also accommodate one mask, but the format is limited to 256 colors. Your best bets are

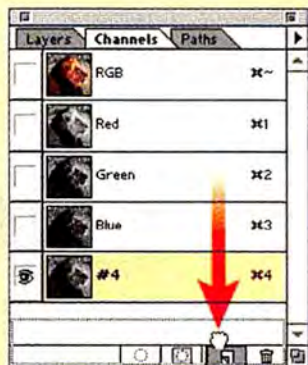
TIFF and Photoshop’s native format: both hold up to 24 channels, and both work miracles of lossless compression on masks (assuming you activate TIFF’s LZW compression).

Basic Masking Theory

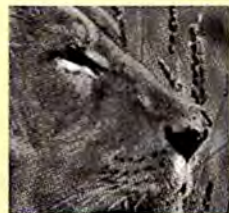
At first glance, the mask version of a selection outline can seem strange. But once you know what Photoshop does when you make a selection, it starts to make sense. Photoshop uses the contents of a mask *continues*

Related Internet Site

Adobe Photoshop
www.adobe.com
408/536-6000

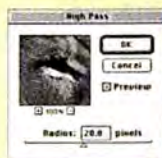


2 Duplicate the green channel Drag the green channel onto the little page icon at the bottom of the Channels palette. You’ve now created a copy of the green information in an alpha channel. This gray-scale image is your mask, and you can edit it independently of your photograph.



A value of 20 pretty well does the trick for any image.

High Pass enhances edges by turning non-edges gray.



3 Filter the mask to bring out edges When selecting hair and other gnarly details, it helps to accentuate edges. The best tool for this purpose is a little-known filter called High Pass, located in the Other submenu under the Filter menu.

4 Adjust levels to boost contrast High Pass leaves the image pretty washed out, so you need to boost the contrast with the Levels command (⌘-L).



Pay careful attention to the contrast along the edges of your proposed selection. Ideally, you want white-against-black edges, or vice versa.

Raise the first Input Levels value, and lower the third value (or drag the black and white slider triangles) to darken the blacks and lighten the whites. Leave a margin of at least 50 between the two Input Levels values to ensure a natural antialiased selection.

continues

Fuzzy Star

After drawing a simple five-pointed star with the lasso tool, I applied the Feather command. Marching ants are inadequate to show the full impact of the command (left), but a mask represents the blurred selection in all its glory (right).



channel as the template from which to re-create your selection. The area that will be outside the selection is black (0); the area that will be inside the selection is white (255). Antialiased and feathered edges appear gray.

The benefits of working inside a mask channel are twofold. First, you can better see the effects of your modifications. For example, when you use the Feather command to blur the edges of a marching-ant selection, the most you see is that the outline rounds off a little in the corners. But if you save the feathered selection as a mask channel, you can view the blurred edges with perfect clarity (see "Fuzzy Star"). For on-screen feedback, entire communities of marching ants can't hold a candle to a lone mask.

Second, you have more tools for

fine-tuning your selection. The only tools you have for controlling the marching ants are the ones you find under the Select menu. But since a mask is a gray-scale image, you can bring all of Photoshop's capabilities to bear on editing it. With practice, you'll learn to predict the effect of mask edits on your final selection outline. For example, painting a white line on the mask with the paintbrush has the ultimate effect of adding to the selection; applying the Gaussian Blur filter to the mask feathers the selection. You can even use the Levels command to spread or choke the selection. You have complete freedom to obsess over the most filigreed details, all without any worry of losing the selection by clicking in the wrong place. Then, when you want to apply the selection, you merely

⌘-click on the mask name in the Channels palette and you're ready to go.

The Quick Mask Mode

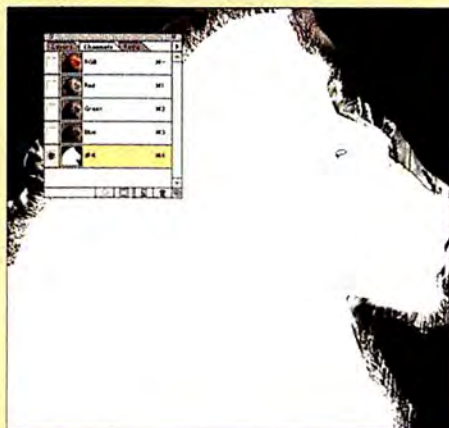
Photoshop's Quick Mask feature provides another glimpse into the wonderful world of masking. Because it's designed to be ephemeral, the Quick Mask mode is best for adjusting selections, not creating them from scratch. In a nutshell, you create or load a selection, enter the Quick Mask mode (by pressing the Q key), paint and edit the selection to your liking, exit the Quick Mask mode (press Q), and use the selection as desired. Unlike when using an alpha channel, the conversions between marching-ant selection and mask occur automatically.

The Quick Mask mode also displays the mask differently than an alpha chan-

So much for the automation, now for the manual labor. At this point, you have what amounts to a very complicated set of outlines—a coloring book for grown-ups, if you will. Remember that your goal in making a mask is to paint the element you want to select white and the background black. Photoshop has given you everything you need to meet this goal. All you have to do is gauge which outlines are important and then color inside them.

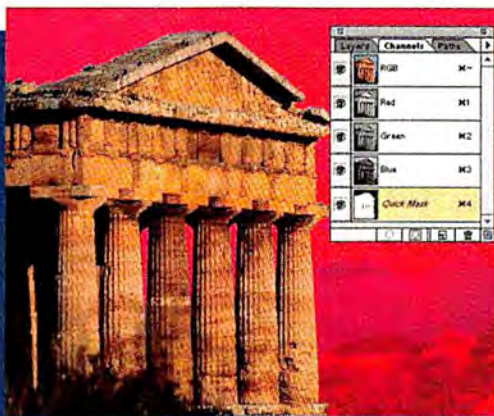
5 Fill in large areas first Because huge areas of the mask need to be solid black or white, it's helpful to block in the general areas with the lasso tool before you start to paint. In my case, I wanted everything inside the lion to be white and everything outside to be black. So I used the polygon lasso tool (you can also option-click with the regular lasso) to select a rough area inside the lion and fill it with white. Then I did the same outside the lion and filled it with black.

Do not attempt to make an accurate selection—work rough, and stay away from the edges of the object you're masking.



6 Fine-tune your mask

From this point on, all you need is one hand on the mouse and the other ready to press the E and X keys. Pressing E cycles you among erasers (paintbrush, airbrush, pencil, or block); X switches the erase color between black and white. I recommend that you spend most of your time with the hard-edged block



Virtual Rubylith

In an alpha channel, Photoshop displays the mask as black and white (left). In the Quick Mask mode, the red mask and image appear together (right). You can customize mask color and the degree of transparency to make it easy to work with your particular image.

nel does. While the selection appears white against black in a channel, the quick mask mode colors the image with a translucent color overlay. The default color is red, which makes the image look much as if you were making masks the old-fashioned way with rubylith (see “Virtual Rubylith”). The red overlay covers the deselected areas of the image; where there is no red, the image is selected. (If you’re working on an image with a lot of red in it, you’ll want to change the default to a color that contrasts better, such as green.)

The advantage of the red overlay is that you can edit the mask and still see the image at the same time. (Alpha channels give you this option too—just press the tilde [~] key.) But painting can be a little confusing. You paint with white to

erase away the color and add to the selection. You paint with black to add to the overlay and subtract from the selection. The mask appears red or transparent, but Photoshop thinks of it as black or white, just like a standard alpha-channel mask. The view is different, but your methods for editing the mask are the same.

Naturally, because this is Photoshop, you don’t have to accept things the way they are. If you bring up the Channels palette while in the Quick Mask mode, you’ll see an item called Quick Mask in italics. The italics show you that the channel is temporary. Click on the first eyeball icon in the palette—or just press the tilde key—to hide the image and view the quick mask by itself. The mask switches from red to black and white, just like an alpha channel mask.

Different Is Better

Understanding masks is mostly a matter of overcoming the fact that they look completely different from marching-ant selections. Leap that hurdle, and you’ll find that masking is a far more accurate and efficient way to select complex elements. The downside to masking is that Photoshop doesn’t provide you any help or advice—you get all of the tools and none of the rules. But that’s OK. Get the basics under your belt. You’ll be surprised how many techniques you’ll discover in your travels. Ultimately, if you can name it, you can mask it. [m](#)

Deke McClelland is the author of *Macworld Photoshop 4 Bible*, *Photoshop 4 for Macs for Dummies*, and *Photoshop 4 Studio Secrets* (all IDG Books, 1997), all designed for different skill levels and learning styles.



eraser. By painting next to the edges with the block eraser, you respect the highly accurate edge detail that Photoshop has given you.

The block eraser is also convenient because it stays a fixed size on screen. You can zoom out and erase in broad strokes or zoom in and paint very small details.

7 Use a transparent color mask for detail work Inevitably, you’ll come to messy areas in your mask that don’t quite make sense. In these cases, press the tilde (~) key to view the color image in the background with the mask superimposed in color.

If Photoshop’s edges aren’t quite right in a specific area—which is a rare occurrence if you set your Levels properly in step 4—you can paint in your own edges with the soft paintbrush eraser (press E once when you have the block eraser selected).

8 Load your selection When you finish painting the mask—roughly a 10- to 15-minute process—return to the composite color view of your image (⌘-tilde). Then ⌘-click on the mask channel in the Channels palette to load the mask as a selection. The selection is now ready to use. I dragged my lion and dropped him into a sky photo. With relatively little effort, I was able to save just about every hair on this proud animal’s head.

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Making Waves with Streaming Audio

With the Right Tools, It's Cheap and Easy to Add Sound to Your Web Site

by Jim Heid

Has anyone listened to your Web site lately? More and more sites are going beyond just text and graphics, and one of the first steps being taken is to add audio. I don't mean adding huge audio files that take a lifetime to download and then reward you with six seconds of a Bart Simpson soliloquy. No, today's buzz in Web sound is *streaming* audio, which lets you start listening within a few seconds after clicking on a link. Streaming audio has made the Web an audio-on-demand broadcasting medium (see www.timecast.com, www.audionet.com, and www.thedj.com).

How can you join in the noise? It's easy and, better yet, economical. Adding streaming audio to a Web site used to require specialized and expensive server software. These days, you can wade into the stream of audio with a few simple tools, many of which are free.

The Key Players

There are several streaming-audio programs that let sound flow from your Web site, but by far the most popular is the one that pioneered streaming audio back in 1995: RealAudio, from RealNetworks (www.real.com), formerly Progressive Networks. RealAudio dominates the streaming-audio field and, since its

debut, has evolved into a full-fledged Internet broadcasting platform. In fact, version 5.0 (in beta at this writing) lets companies broadcast commercials and pay-per-view events.

Another noteworthy product is Shockwave Audio, from Macromedia (www.macromedia.com). Shockwave Audio is less popular and versatile—rather than being a platform for Web broadcasting, it's an adjunct to Macromedia's Shockwave for Director. Still, using Shockwave Audio is a fine way to stream audio. Its sound quality is excellent, even over modem connections. And contrary to what many newcomers think, Shockwave Audio clips are easy to add to your Web

site—you don't have to use Macromedia Director.

The playback tools for RealAudio and Shockwave Audio are free. RealNetworks' RealPlayer is a helper application that handles not only RealAudio playback but also RealVideo and now RealFlash, a streaming version of Macromedia's Flash animation technology. If you don't need the extra features of the helper application but instead want a simple plug-in that enables playback of clips embedded directly within Web pages, you can use RealPlayer's plug-in module instead. With RealNetworks' \$29.99 RealPlayer Plus software you can also improve playback quality and let visi-

tors create car-radio-like preset buttons for jumping to their favorite sites.

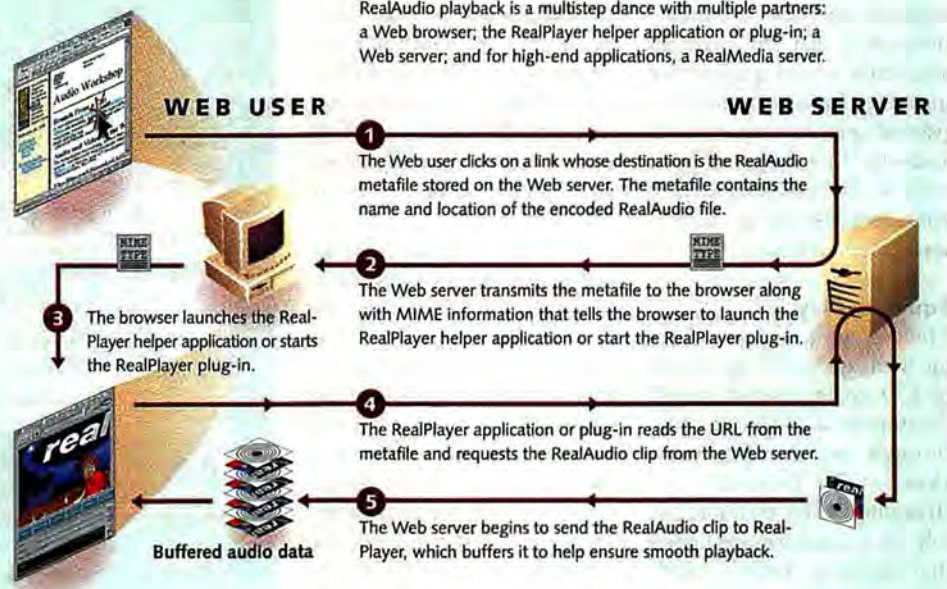
As for Shockwave Audio, visitors must use Macromedia's bare-bones plug-in for playback; Macromedia doesn't offer a separate helper application with extra features. For a look at both players, see "Hear Here: Streaming-Audio Players."

How the Stream Flows

Streaming-audio playback is a bucket-brigade affair that relies on the ability of a listener's computer to play sound while simultaneously downloading it. When visitors click on a link to play an audio stream, their browsers launch *continues*

Into the Stream: How RealAudio Works

RealAudio playback is a multistep dance with multiple partners: a Web browser; the RealPlayer helper application or plug-in; a Web server; and for high-end applications, a RealMedia server.



either a plug-in or a helper application that can play streaming audio in the required format.

This playback software contacts the Web server and then downloads into memory a small portion of the sound before beginning playback, a process called *buffering*. Once a predetermined amount of audio (usually several seconds' worth) has been buffered, playback begins. As the audio plays, the playback software continues downloading and stashes the incoming audio in the memory buffer.

By sitting between the incoming bit stream and the playback engine, the buffer helps guard against playback interruption caused by Internet congestion or server slowdown. Unless downloading slows to a crawl or worse, the buffer will always contain some ready-to-play audio. If serious download delays do occur—and on today's busy Internet they sometimes do—playback stops until the buffer's stash is replenished.

When preparing audio for streaming, you can minimize the risk of interruptions—and indeed, minimize your contribution to Internet congestion—by preparing the audio for the slowest connection speed that still provides acceptable sound quality. For instance, if your content consists of speech, prepare your audio for 14.4-Kbps modems, even if the vast majority of your site's visitors use higher-speed connections.

Squeeze Play

Modems are too slow to keep up with an incoming stream of CD-quality stereo sound. To squeeze a stream of audio through the drinking straw that is the Internet, all streaming-audio technologies rely on compression schemes that decrease audio's bandwidth requirements. The de-

crease comes from lowering the audio's sampling rate, filtering high frequencies, and performing other waveform-shaping chores. This compression process, called *encoding*, is an essential step to deploying streaming audio.

Compressing audio for streaming isn't like compressing a sound file with Aladdin Systems' StuffIt. Streaming-audio encoders use *lossy* compression schemes—ones that sacrifice quality in the interest of reducing file size. In that sense, compressing audio for streaming is more akin to saving an image in JPEG format.

Lossy compression always means reduced quality, but streaming-audio compression schemes have improved dramatically since the early days of RealAudio 1.0's encoder, which I used to describe as offering shortwave-quality sound. The latest compression routines use *perceptual-coding* techniques, which take advantage of our inability to hear some kinds of signal loss.

Making Your Own Waves

So how can you get in on this racket? For starters, you need an audio-editing program for digitizing and editing sound. The top Macintosh audio editors are Macromedia's \$419 SoundEdit 16 (which also includes Deck II) and BIAS's (510/843-6485, www.bias-inc.com) \$499 Peak 1.6 and \$99 Peak LE. For basic digitizing and editing, Peak LE is an excellent choice.

After you digitize and edit audio, you need to encode it for streaming. If you're deploying RealAudio, you can encode directly within any of the aforementioned programs. If you opt for Shockwave Audio, you can download a free Shockwave Audio export module for SoundEdit 16 from www.macromedia.com/support/soundedit/how/shock. (It has instructions for

posting Shockwave Audio on a Web site.)

You can also create RealAudio files with a variety of stand-alone encoder programs, starting with RealNetworks' free RealAudio Encoder. Two commercial compression utilities also encode RealAudio: Terran Interactive's revered Media Cleaner Pro (\$359; 408/278-9025, www.terran-int.com) and Waves' WaveConvert Pro (\$500; 423/689-5395, www.waves.com). Media Cleaner Pro is easier to use and can also handle digital video (indeed, that's its forte—see *Reviews*, October 1997), but WaveConvert Pro has more quality-optimizing features. In the end, you may find RealNetworks' free encoder perfectly adequate for your application, so start there.

After encoding, you're

ready to post your audio to your Web server so that the rest of the world (or the rest of the office) can listen in. You'll find step-by-step instructions for adding RealAudio clips to your site in "RealAudio on Your Web Site—Sound Good?"

Serving Streams

I mentioned that streaming audio used to require specialized server software. I was referring to RealNetworks' RealMedia server, which doesn't use the HyperText Transfer Protocol (HTTP) that conventional Web servers use. Several aspects of HTTP's design make it an imperfect protocol for streaming-media applications, and as a result, RealAudio was originally designed to use exclusively a transmission scheme called the User

Hear Here: Streaming-Audio Players

RealNetworks' RealPlayer is the gateway to the Internet's most sophisticated streaming-audio technology. It comes with such features as fast-forwarding and rewind. (Note that fast-forwarding works best with sites that use a RealMedia Server as opposed to a server that streams using HTTP.)

The horizontal playback slider enables listeners to jump forward and backward within an audio clip—something most other streaming-audio technologies do not permit.



Listeners can customize each of the preset buttons to jump to their favorite Web sites.

Datagram Protocol (UDP).

RealNetworks has since adapted RealAudio to work over HTTP also—enabling you to dish out RealAudio files using any Web server. (Shockwave Audio also uses HTTP.) HTTP streaming is an ideal way to test the waters of streaming audio.

High-end RealAudio providers—for example, National Public Radio (www.npr.org)—can benefit from investing in a RealMedia Server. UDP streams more reliably than does HTTP, particularly for busy sites. Using a RealMedia Server also lets you take advantage of one of RealAudio's more exotic features: synchronized multimedia, which lets you synchronize the display of Web pages to the playback of a RealAudio clip.

RealMedia Servers are available for Windows 95,

Windows NT, and various flavors of Unix, but not for the Mac OS. That doesn't mean that you're left out if you're hosting a site using Mac servers. You can get the added benefits of the RealMedia Server by contracting with a service provider that offers RealMedia hosting; RealNetworks' site contains a directory of hosting services.

Head Downstream

Streaming audio can be a wonderful enhancement to a Web site, one that attracts visitors and takes advantage of the Web's multimedia potential. Conquer it, and you'll be well positioned to take the next step: streaming video. **m**

JIM HEID produced RealAudio content for his Web documentary about rural Internet access (www.nobackroads.com).

RealAudio on Your Web Site—Sound Good?

A five-step plan for desktop broadcasting

RealNetworks' RealAudio democratized broadcasting by enabling anyone to make audio available to a worldwide audience via the Internet. Well, almost anyone. The first RealAudio releases required specialized, expensive server software to dish out clips using RealAudio's custom protocol—you couldn't use the Web server that's already serving up your Web site's pages.

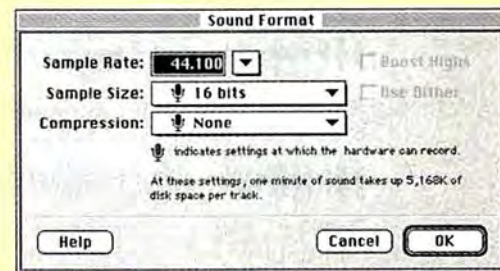
All that changed with RealAudio 3.0, which also supported streaming through the HyperText Transfer Protocol (HTTP). You still get the most reliable results using RealNetworks' RealMedia Server software, but you can now deliver RealAudio clips using any Web-server software, even freeware such as Social Engineering's QuidProQuo (www.socialeng.com).

Whether you're deploying RealAudio through HTTP or through a RealMedia server, there are several steps to preparing your clips. The following instructions assume you're using Macromedia's SoundEdit 16 for digitizing and editing audio, and RealNetworks' free RealAudio Encoder to compress your clips into RealAudio format. The basic concepts apply to other audio tools as well, such as BIAS's Peak and Peak LE.

1 Prepare the Sound

Modem-bound RealAudio clips don't exactly have that CD-quality sizzle, but that doesn't mean you're allowed to skimp when recording the original sound. In fact, the opposite is true: you get the best sound when you start with top-quality originals.

Record Use high-quality gear when recording original content. Don't skimp on components such as microphones and recording decks. (A good source for audio products and advice is Sweetwater Sound [219/432-8176, www.sweetwater.com]).



Digitize Use a full 44kHz, 16-bit sampling rate when digitizing. To specify the sampling rate in Macromedia's SoundEdit 16, choose Sound Format from the Modify menu. Do this before you've digitized the sound, not after.

Edit Make your changes to the clip, and save it as an AIFF file (in SoundEdit 16's Save As dialog box, choose the Audio IFF format).

continues

Macromedia's Shockwave Audio plug-in is actually a Shockwave for Director movie that loads and plays a Shockwave audio file. Both of the players shown here are included with the free Shockwave Audio export module for SoundEdit 16 (which you can download at www.macromedia.com/support/soundedit/how/shock/).



This simple player plays just a single audio clip.



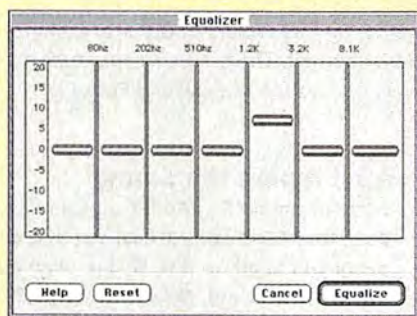
With this player, you can create a list of clips that a visitor can play in any order.

2 Optimize for Quality

Audio-compression software does the best job when you give it a *hot* recording—one whose overall levels are as loud as possible without distortion. Besides setting your recording levels appropriately to begin with, there are a couple of things you can do to fatten up a track before encoding it. You don't have to perform any of these tasks before encoding, but doing so will pay off with less distortion and cleaner sound.

TIP Before performing audio alterations on your only copy of a large file, conduct some tests using a small section of it. Select a portion representative of the overall recording; copy it to the Clipboard; and then paste it into a new, untitled document. Perform your tests on this document. Write down your preferred settings so you can re-create them with the full clip.

Equalize Equalization, or EQ, boosts or lowers specific frequency ranges—it's an ultraprecise set of treble and bass knobs. Use SoundEdit



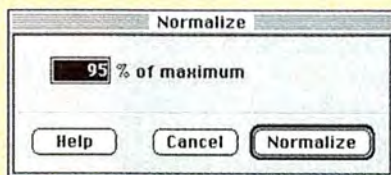
16's Equalizer dialog box (from the Effects menu) to boost the midrange—the frequencies around 2.5kHz—a bit. Don't go overboard; the latest RealAudio codecs don't need much EQ.



In compressed audio (bottom) the amplitude of the quiet sounds gets larger.

Compress Webmasters have become familiar with the word *compression*, but here it is being used in yet another way. In the audio world, compression reduces the differences between the loudest and quietest parts of a sound signal. Applying it to

budding RealAudio files can minimize aural artifacts. SoundEdit 16 doesn't have a compression feature, but you can use Waves' Native Power Pack, whose C1 Compressor/Gate plug-in and Wave-Convert utility are superb level-enhancement tools. Or if you have access to a Windows 95 or NT computer, use Sonic Foundry's (608/256-3133, www.sfoundry.com) awesome \$495 Sound Forge, which has complete compression features.



Normalize Normalizing boosts a sound clip to its maximum loudness. Choose Select All from the Edit menu, and then choose Normalize from the Effects menu. Use a Normalize value of about 95 percent. Higher values can cause distortion with RealAudio.

Prioritize Optimization If you have time for just one task, normalizing is by far the most important. Compression comes next, and then EQ. Just be certain to make normalizing the final step in your optimizing process. Don't add compression or EQ after normalizing—you will risk distortion.

3 Encode for RealAudio

RealNetworks has made encoding (compressing and converting a clip into RealAudio format) one of the easiest parts of the RealAudio production process. You can encode directly within SoundEdit or use the free RealAudio Encoder. Both options provide identical quality settings, each accompanied by a helpful description of its best uses.

SoundEdit 16 Be sure you've installed the SoundEdit 16 Xtra named RealAudio Exporter; it's included with the RealAudio Encoder. Choose Export from the File menu, and choose RealAudio .RA File from the Export Type pop-up menu. Name the file (since some servers impose a limit on file-name length, keep the name under eight characters; don't use spaces; and end the name with *.ra*, as in *mysound.ra*). Click on Save, and the RealAudio Exporter dialog box appears.



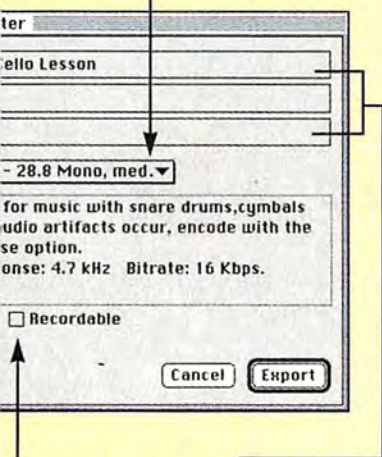
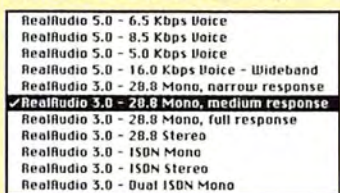
When this box is checked, the file is encoded to work with RealPlayer Plus's Perfect Play feature, which allows modem users to hear higher-quality audio.



RealAudio Encoder If you are using the stand-alone encoder for a file you've already edited, click on the encoder's Input button and then locate the file to be encoded.

TIP If you frequently use the same encoder settings, use the File menu's Preferences command to specify them.

Choose the desired encoder setting.



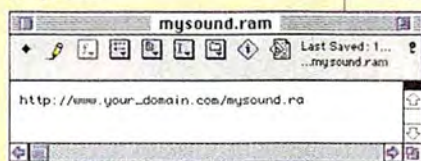
To allow users of RealPlayer Plus to save clips on their hard disks, check this box (normally, users can listen to but not save RealAudio clips).

Information entered here is displayed by RealPlayer during playback.

4 Create the Metafile

You can't simply link to an encoded RealAudio file by using the <a> tag. If you did, the entire RealAudio file would have to be downloaded to a visitor's hard disk before playback could begin—thus defeating RealAudio's streaming features.

To stream a RealAudio file, you must create a *metafile*—a one-line text file that references the .RA file. You then reference that metafile in your HTML page. When a visitor clicks on the link, the metafile causes the visitor's RealPlayer to launch and begin playback.



Say you've encoded a RealAudio file and named it *mysound.ra*. To create the metafile, open your favorite text editor and type `http://www.your_domain_here.com/mysound.ra`.

(In this example, I'm assuming you will be streaming with a standard HTTP server, not a RealMedia server. If you're using a RealMedia server, use *pnm*: as the URL's locator rather than *http*.)

Save the metafile as *mysound.ram*, and load both it and the encoded file on your server.

5 Grind the HTML

You can make RealAudio clips available in one of two ways: through conventional hyperlinks or by embedding the clip directly within the page, relying on the RealAudio plug-in for playback.

The vast majority of RealAudio sites use the hyperlink approach, which relies on RealPlayer for playback. To link to a clip, create a hyperlink to the metafile (`Listen to this!`).

Linking Linked clips can be more reliable than embedded ones (loading plug-ins can sometimes cause a browser to go south), and linking allows visitors to take advantage of the nifty features of RealPlayer and the \$29.99 RealPlayer Plus. Both, for example, list recently listened-to clips in their File menus, and RealPlayer Plus has additional features that improve sound quality.

Embedding RealAudio Embedding has its appeal too. You can wrap a custom interface around your clips—an antique radio graphic, for example, or a boom box. And the RealAudio plug-in is installed automatically whenever someone uses the RealPlayer installer's default installation settings, so most current RealPlayer users have the plug-in. Here's how to take advantage of it.

First, instead of ending the RealAudio metafile's name with *.ram*, end it with *.rpm*. Second, use the `<embed>` tag in your HTML page as shown below.

```
<html>
<head>
<title>
RealAudio Plug-in Example
</title>
</head>
<body>
Listen to my kid's first violin lesson.
<br>
<embed
src="http://www.your_domain.com/mysound.rpm"
width=275 height=125>
</body>
</html>
```

TIP The HTML above gives you the standard RealPlayer interface. The RealAudio plug-in supports a variety of `<embed>` attributes that let you create a custom mix of buttons and controls. RealNetworks' Developer Zone has a great page that builds `<embed>` tags for you based on the controller options you use. You'll find it at www.real.com/create/plugtest/plugin.html.

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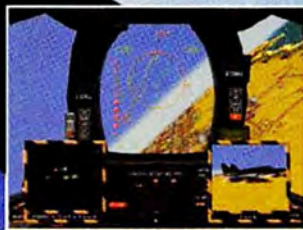
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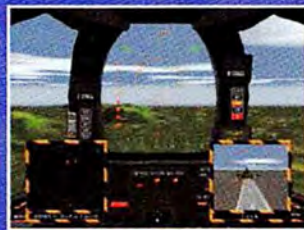
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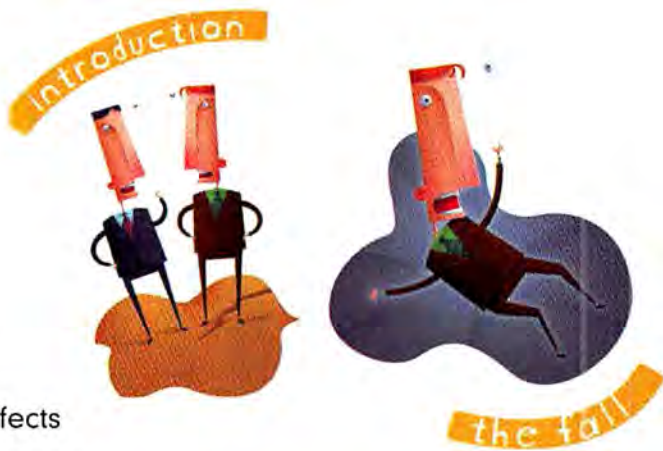
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Effective Sound

Create the Right Atmosphere with Audio Effects

by Christopher Breen

Try this experiment: Rent the scariest movie you can find, jam it into the VCR, turn down the lights, and press Play. Now turn off the sound. Not terribly spooky, is it? Without the atmosphere provided by the soundtrack, that once terrifying movie is just an object lesson in the dangers of overapplying cosmetics.

Creating atmosphere through sound is just as important in multimedia as it is in B movies. With the help of your Mac, audio-editing software, and a few plug-in effects, you can create the illusion of just about any environment imaginable. To demonstrate, I created a short audio melodrama in the audio-editing software Peak, from BIAS (415/331-2446). From within Peak, I applied a variety of effects, using

BIAS's SFX Machine and Arboretum Systems' (415/626-4400) HyperPrism-MMP plug-ins. Finally, I assembled the whole show in Macromedia's (415/252-2000) SoundEdit 16.

The scene opens in the barren waste of the Mojave Desert. Two men approach. They are arguing. Suddenly we hear the rending of wood and a scream as one falls into an abandoned mine shaft. The fallen man begs the other to call for help on his cellular phone. The man with the phone tussles with his conscience and then makes the call. Dramatic music swells forth followed by the husky voice of the narrator, who extols the virtues of expensive cellular communications. **m**

When not tinkering in his MIDI/digital-audio project studio, *Macworld* contributing editor CHRISTOPHER BREEN longs for the golden age of radio.



2 The Fall

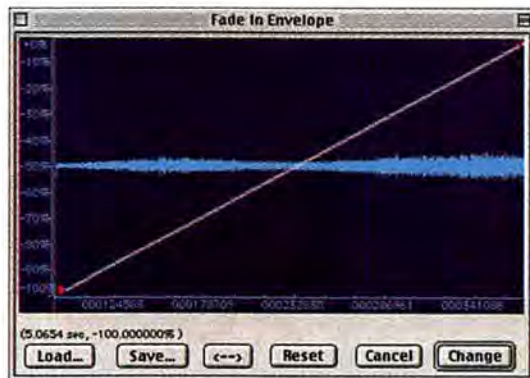
I wanted the illusion of a departing body, so I applied a fade-out (Preferences: Fade-Out Envelope) on the scream of the character rapidly tumbling down the mine shaft. To make the scream fade quickly, I adjusted the slope of the linear fade (A) in Peak's Fade Out Envelope window. I also adjusted the end of the fade from 100 percent to 75 percent so that the scream didn't disappear entirely (B). I resisted the temptation to add a satisfying *whump!* after the scream.

Add Drama to Soundtracks with Plug-in Effects

1 Gentle Introduction

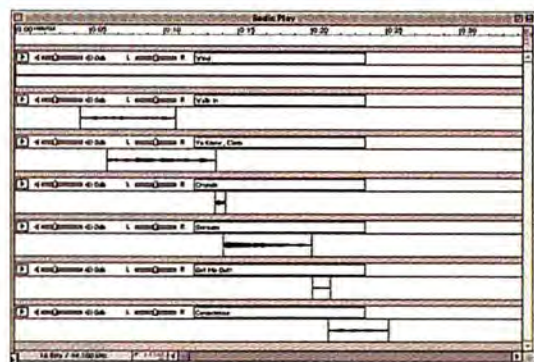
To ease our listeners into the drama, I employed a fade as the first effect. This effect gradually raises or lowers volume over time. From within Peak, I selected the first five seconds of a wind sound file and chose Fade In from the DSP menu. I used a linear fade to get a constant volume increase, but you can adjust the shape of the fade—make it curved, for example—by selecting Fade In Envelope from Peak's Preferences menu.

Fading also creates the illusion of an approaching object. Because the two characters were indeed coming my way, I applied a fade-in to their footsteps and voices as well.



DSP

- Amplitude Fit...
- Change Duration...
- Change Gain...
- Crossfade Loop...
- Invert
- Fade In**
- Fade Out
- Gain Envelope...
- Find Peak
- Mono To Stereo...
- Stereo To Mono...
- Normalize...
- Phase Vocoder...
- Rappify...
- Repair Clicks...
- Reverse Boomerang...
- Reverse
- Sample Rate Conversion...
- Threshold...



3 Inside the Mine

To create the effect of being in a mine shaft, I applied two other effects to the scream—reverb, to add the feeling of expansiveness, and delay, to make the sound seem to reflect off the walls of the mine shaft. I selected all but the first half-second of the scream and then applied HyperPrism-MMP's Medium Room Reverb effect. The Mix slider adjusts the intensity of the reverb, and the Feedback slider adjusts how long the reverb lasts. I used 50 percent of both to make the scream quite reverberant. I then used the 2 to 1 Echoes effect, from BIAS's SFX Machine plug-ins, to add delay.

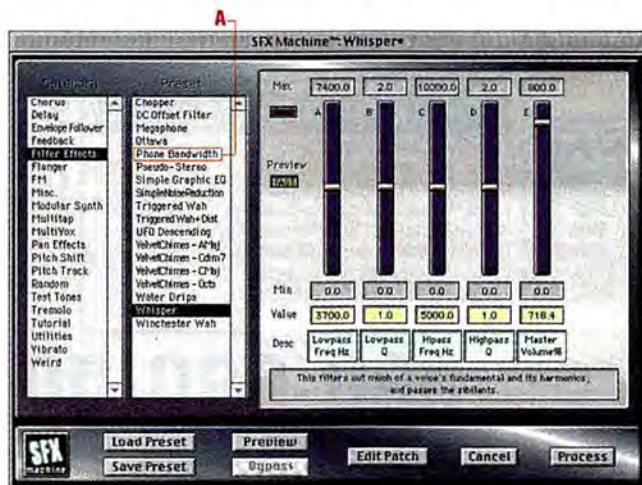
During his plea for help, I again used reverb and delay on the shafted man's voice, although I cut back on both so that his words would be distinguishable. To create the illusion of distance, I also reduced the volume of his voice, using Peak's Change Gain command.

4 The Conscience

I employed drastic filtering to create the sound of the conscience of the man above ground. SFX Machine comes with Whisper, a filter effect that provides the perfect tone—removed and a little malevolent—for the conscience in this drama.

Using a combination of low-pass and hi-pass filters (which adjust the amount of a sound's high and low frequencies), Whisper cuts the fullness out of the voice and leaves a thin, sibilant hiss. Since cutting the fundamental tones of the voice reduces the overall volume, I increased the loudness of the sound with Whisper's volume slider.

I added a touch of reverb, as in the third step, to create the effect of a voice coming from the "other side." To create the sound of a voice coming over the phone, I selected a different filter, Phone Bandwidth (A), from SFX Machine's Filter Effects.



5 Big Finish

With the sound bites collected and edited, I opened SoundEdit 16 and imported my sound files into a single document. Using the drag command (holding down the option key and clicking and dragging on sound files), I was able to position the sounds in the proper sequence.

One last touch-up: to get a consistent overall volume, I applied a normalize effect. This amplifies a sound to its maximum volume without making it so loud that it distorts. I selected everything in my SoundEdit 16 document, chose Normalize from the Effects menu, left the default setting (100 percent of maximum) in the Normalize dialog box, and clicked on OK.

Related Internet Sites

Arboretum Systems
www.arboretum.com

BIAS
www.bias-inc.com

Macromedia
www.macromedia.com

License-free sound effects
www.janusinteractive.com

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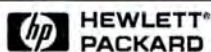
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Table listing handheld computers like eMate 300, MessagePad 2000, and various monitors.

Table listing various monitors from brands like MultipleScan, AppleVision, and AppleVision.

Table listing MAG brand monitors like DJ530, DJ702E, and DJ920.

Table listing PHILIPS MAGNAVOX monitors like MB5314 and MB7000.

Table listing NEC monitors like A500, E500, A700, E700, P750, E1100, and P1150.

Table listing SONY monitors like 100sf, 100es, 200sf, and 200sl.

Table listing ViewSonic monitors like E641, E655, G653, E771, EA771, G773, 17GA, GT775, PT775, G790, G800, G810, and P810.

Table listing VIDEO BOARDS like Nexus GA, Xclaim TV, Xclaim 3D, Xclaim 3R, and Xclaim VR.

Table listing various video capture and processing boards like Turbo TV and Twin Turbo.

COMMUNICATIONS

Table listing communication devices like Megahertz Ethernet, PC Card w/RJ11, Sportster Voice, Sportster 33.6, Sportster 56K, and Courier I-modem.

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Table listing communication devices like TelePort 56K, TelePort 56K 56Flex, 56K bps fax/modem, and 56K bps fax/modem/Ethernet.

Table listing ACCURA 336 and 56K external devices.

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Table listing Hi-Val SounTastic 12X CD external, Hi-Val SounTastic 12X CD Kit, Hi-Val SounTastic 16X CD external, Hi-Val SounTastic 16X CD Kit, Hi-Val SounTastic 2X6, and Hi-Val SounTastic system external.

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Table listing Quantum Fireball ST Ultra-ATA, Fireball ST Ultra-ATA, Fireball ST Ultra-SCSI, Fireball ST Ultra-ATA, Fireball ST Ultra-SCSI, Fireball ST Ultra-ATA, Fireball ST Ultra-SCSI, Fireball ST Ultra-ATA, and Fireball ST Ultra-SCSI.

Table listing SyQuest EZFlyer 230MB external, EZFlyer 230MB cartridge, SyJet 1.5GB SCSI internal, SyJet 1.5GB SCSI external, and SyJet 1.5GB cartridge.

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Table listing AGFA ePhoto 307 digital camera, SnapScan 600 flatbed scanner, StudioStar flatbed scanner, and Arcus II flatbed scanner.

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Table listing ADDSO PowerMouse, Soft Touch Plus extended keyboard, NU-Form extended keyboard, NU-Form extended keyboard w/touchpad, Tru-Form extended keyboard w/pointer, Tru-Form extended keyboard, and Tru-Form Touch Pad.

INPUT DEVICES

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Table listing HP ScanJet 6100ese flatbed scanner.

Table listing Kodak DC20 digital camera, DC25 digital camera, DC50 digital camera w/Zoom lens, DC120 digital camera w/Zoom lens, and DC210 digital camera.

Table listing MICROTEK Color PageWiz personal scanner, ScanMaker V300 scanner, ScanMaker E3 scanner, ScanMaker E6 Standard scanner, and ScanMaker E6 Professional scanner.

Table listing Nikon Coolpix 300 digital camera, AX-210 ScanTouch flatbed scanner, LS-20 Super CoolScan II, and Super CoolScan film scanner.

Table listing Polaroid PDC 2000/40 digital camera, SprintScan 35LE film scanner, SprintScan 35ES film scanner, and SprintScan 35+ film scanner.

Table listing UMAX Astra 600S flatbed scanner, Astra 1200S flatbed scanner w/full Adobe PhotoDeluxe, Astra 1200S flatbed scanner w/full Adobe Photoshop, and PowerLook II.

Table listing VISIONEER PaperPort vx scanner.

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Table listing LaserWriter 4/600 PS, LaserWriter 12/640 PS, LaserWriter 16/600 PS, LaserWriter 8500, Color LaserWriter 12/660 PS, Color StyleWriter 4100, Color StyleWriter 4500, and Color StyleWriter 6500.

Table listing EPSON Stylus Color 600, Stylus Color 800, Stylus Color 1520, Stylus Color 3000, and Stylus Photo.

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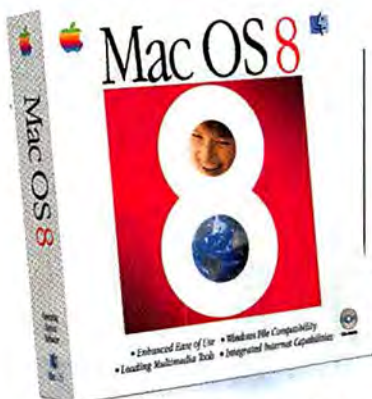




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- CD-R Media Single/10-Pack 1.99/18.

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 - 3 GB Hitachi Slim 12ms 399.
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 - Jaz Drive Internal SCSI 299.
 - Jaz Drive External SCSI 369.
 - Zip Drive Internal SCSI 149.
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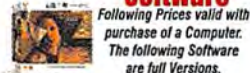
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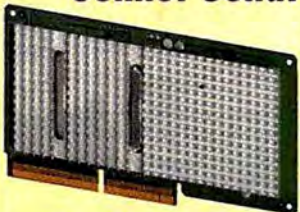
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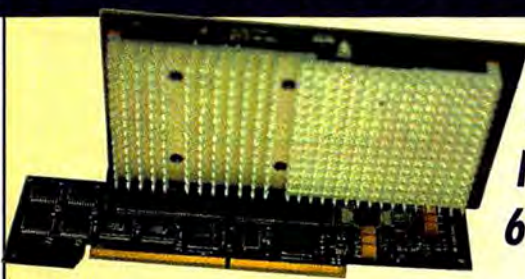
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PUBLISHING 98

continued from page 194

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We've joked for years that Bill Gates would love to wipe the Mac off the map. Surprise! In fact, Microsoft is frantically trying to *save* the Mac. It invested \$150 million in Apple, paid Apple hundreds of millions more in "technology agreements," sent 100 programmers to San Francisco to write Mac software (thus creating the largest Mac software company), and bent over backward to make Mac Office 98 top-notch.

In the Microsoft Intervention scenario, then, Microsoft would buy Apple, or fund it and turn it into Microsoft's R&D lab. Apple, the undisputed headquarters for innovation and good design, would be the ideal farm club for Microsoft, the undisputed headquarters for marketing. Sure, the FTC would shriek "monopoly!" but Microsoft would correctly point out that a Microsoft-funded Apple is better than no Apple.

The Rhapsody Stratagem

The intriguing thing about Apple's upcoming Rhapsody OS is that it'll be available for Mac and Intel computers. What if it's a huge hit? What if it's cheaper and less troublesome than Windows and NT? What if it dawns on software companies that they can write *one* Rhapsody program and sell it on both "Mac" and "Windows" machines?

The experience of using a computer is determined mostly by its system software. In other words, Rhapsody will put Apple elegance on *any* personal computer, no matter who made it. Every PC in the world will become, in effect, a Mac.

On the other hand, a Rhapsody triumph would mean nobody'd have to buy computers from Apple anymore. Has Apple thought this thing through?

The Tortoise/Hare Conundrum

Microsoft, as you may have noticed, hasn't exactly been hitting home runs lately. Only a fraction of the population upgraded to Windows 95; much of corporate America, having finally got the kinks out of Windows 3.1, has no intention of budging.

Suppose, then, that the air gradually begins leaking out of Microsoft's tires. Subsequent Windows versions become absolute monstrosities, laughable bloatware that requires 128MB of RAM. And just to make this scenario more interesting, suppose Rhapsody's a flop.

What everybody forgets is the traditional Mac OS. It's a proven hit—comfortable, elegant, and state-of-the-art in many ways. Suppose Mac OS 9 and 10 are faster and stabler; suppose future PowerPC chips make the Pentium look increasingly ancient. The Mac might simply become too attractive to ignore. "Man, I wish I could have a computer as fast as that one I saw over at Frank's," millions of individuals will say around millions of kitchen tables.

As Microsoft finds itself unable to sustain the kind of crazy growth it had back in the 1990s, Wall Street and the media will reward it with bad press and sinking stock prices. And quietly, over a decade, the Mac will tiptoe its way to a 25 percent market share . . . and beyond.

Hey—you never know. ■

DAVID POGUE (www.pogue.com) is the editor of *The Microsloth Joke Book* (Berkeley, 1997).

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The Apple Doomsday Scenario

IN WHICH WE VANQUISH OUR FEARS BY CONFRONTING THEM

APPLE WILL DIE IF it permits cloning; Apple will die if it doesn't. Apple will die if it collaborates with Microsoft; Apple will die if it fights. Apple will die unless it splits into two companies; Apple will die if it doesn't do a better job of supporting games.

I'd like to have *one* conversation with a Mac columnist, consultant, or programmer without hearing a pompous prediction of Apple's death. These people have a lot of nerve pretending to know what will or won't save Apple. In 1980, would Seattle Computer have sold its DOS program to Bill Gates for \$15,000 if it had known Microsoft would make billions off it? In 1981, would Xerox PARC have let Steve Jobs tour its lab if it had known the \$12 billion Macintosh industry would result? Don't be fooled: In the computer industry, *nobody* can see the future.

When you get right down to it, only one of three fates can befall Apple: It will die, it will survive as is, or it will change. Here, for your cocktail-party conversation pleasure, are the most plausible futures for our favorite computer maker.

The Atari Hypothesis

Let's come right out and say it: Our biggest fear is that the Mac will shrivel up and disappear. Like the Atari or the Amiga in the 1980s. We'll be stuck with no software, sales, or support, orphans of another superior technology frittered away by bungling businessmen. *Macworld* will become a two-page newsletter and finally cease publication altogether. You'll switch to Windows or keep using your Mac till you can't get parts anymore. I'll go back to conducting musicals.

Then what? Then Windows will be the only operating system. Microsoft will suddenly be a monopoly. The FTC's antitrust lawyers will swarm over Bill

Gates like ants, and the Feds will break Microsoft up into smaller companies.

No way. Bill Gates won't let it happen.

The Equilibrium Scenario

Another reason why the Atari scenario isn't convincing: The Atari never had a huge following of fanatics like the Mac's. Nor did the Atari gain total domination of important markets, as the Mac has in the arts, sciences, and publishing.

If Apple continues to botch the business angle, the number of Mac fans will continue to shrink. Corporations will

lion who refuse to budge. Apple becomes so small that it's profitable again, sustained by the hardware and software purchases of the 10 million—small enough to be aggressive and fast-moving. Likewise, the 15,000 programs available for the Mac today might shrink to 1,000, but 10 million people are still a market; seizing an opportunity, a few companies will continue producing software for the diehards.

The Buyout Theorem

With 28 million customers, our favorite computer is a plum product ripe for picking. Suppose Apple's stock just keeps sinking. There's got to be some price—maybe it's \$10 a share, maybe \$5—where the company's golden brand image, loyal audience, and technology vault are irresistible. To Sony, maybe. Or Umax. Or some other company with deep pockets and major connections overseas.

A takeover might just be the best thing that ever happened to the Mac. After all, Apple's problem isn't the product; it's the management. Suppose the reins were taken over by an established electronics giant with years of experience in business, customer service, and marketing.

You know—Apple with a brain transplant.

Motorola, feeling a shift in the air, would start advertising *its* chips on TV, just like Intel does now. Software titles would come gushing out. The Macintosh tide would turn.

The Microsoft Intervention

Microsoft has a lot to lose if Apple croaks. Microsoft makes \$500 million a year selling Mac programs, of course; but more important, Microsoft gets a rich supply of technology and ideas from Apple.

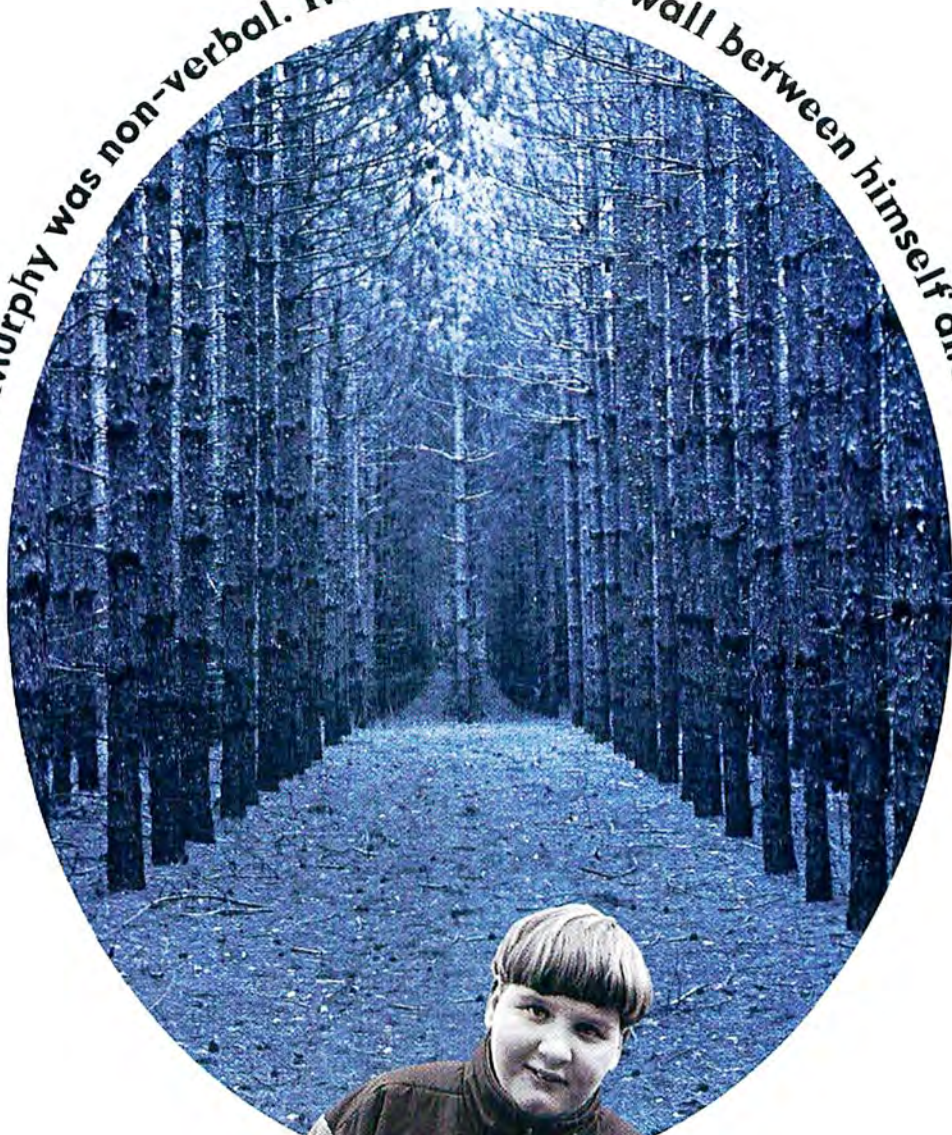
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clear out all the Macs except for those in their graphics and creative departments; schools might settle on Windows machines, never mind the cost of keeping them running; families who can afford a Windows consultant now and then may even abandon the Mac.

But in the last year, I've heard at least 100 people swear they'd use their Macs until the last bolt fell out. They'd sooner go back to an electric typewriter than face the clunky complexity of Windows. In the Equilibrium Scenario, then, the market shrinks until nobody's left but the 10 mil-

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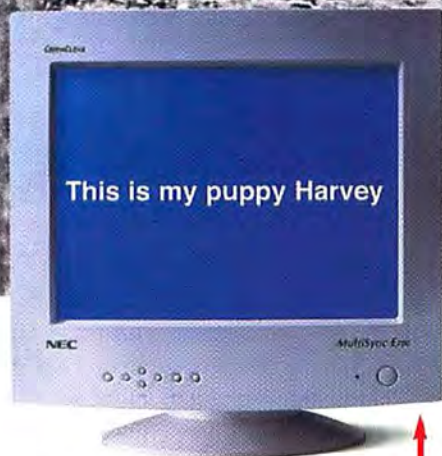
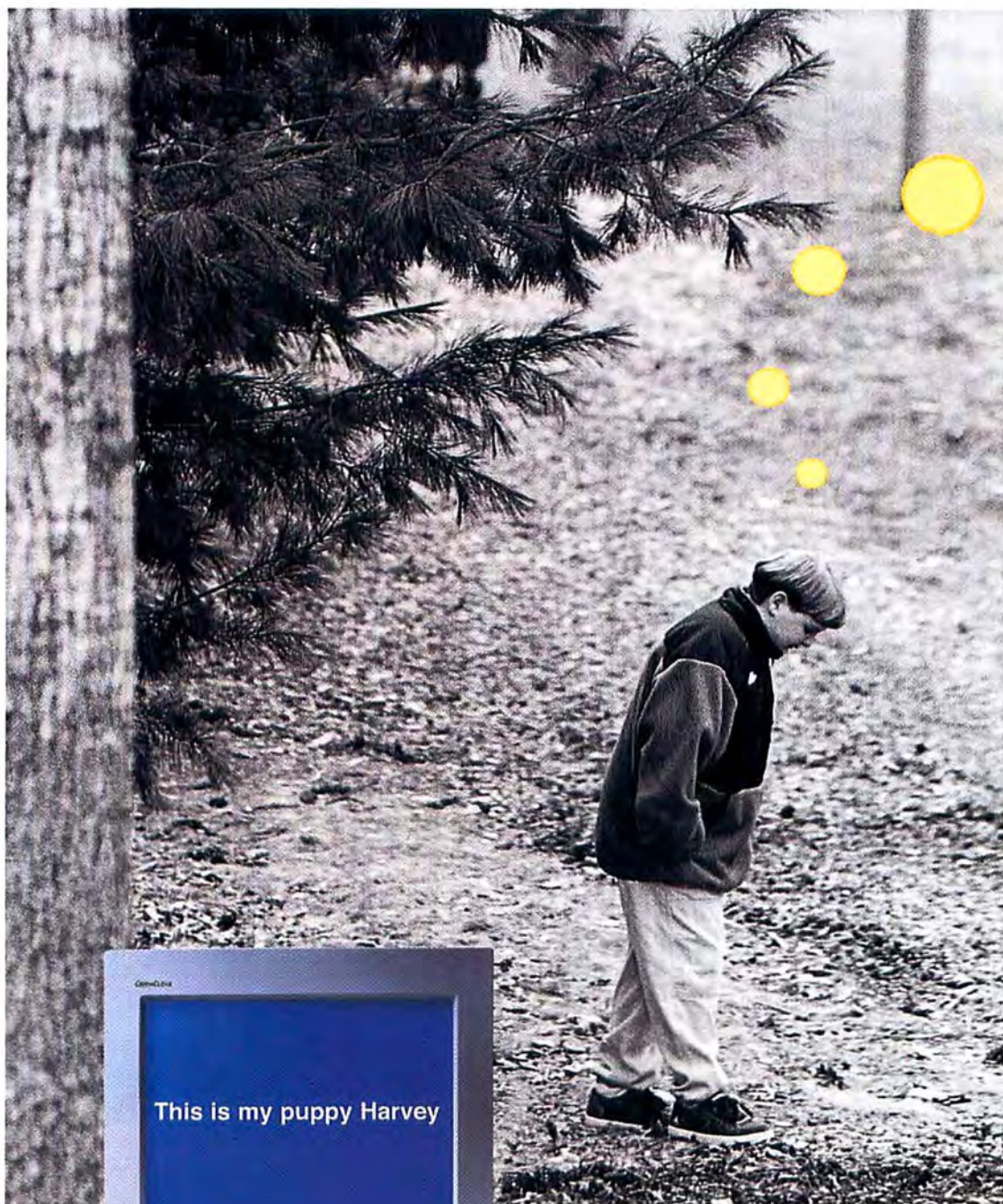
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